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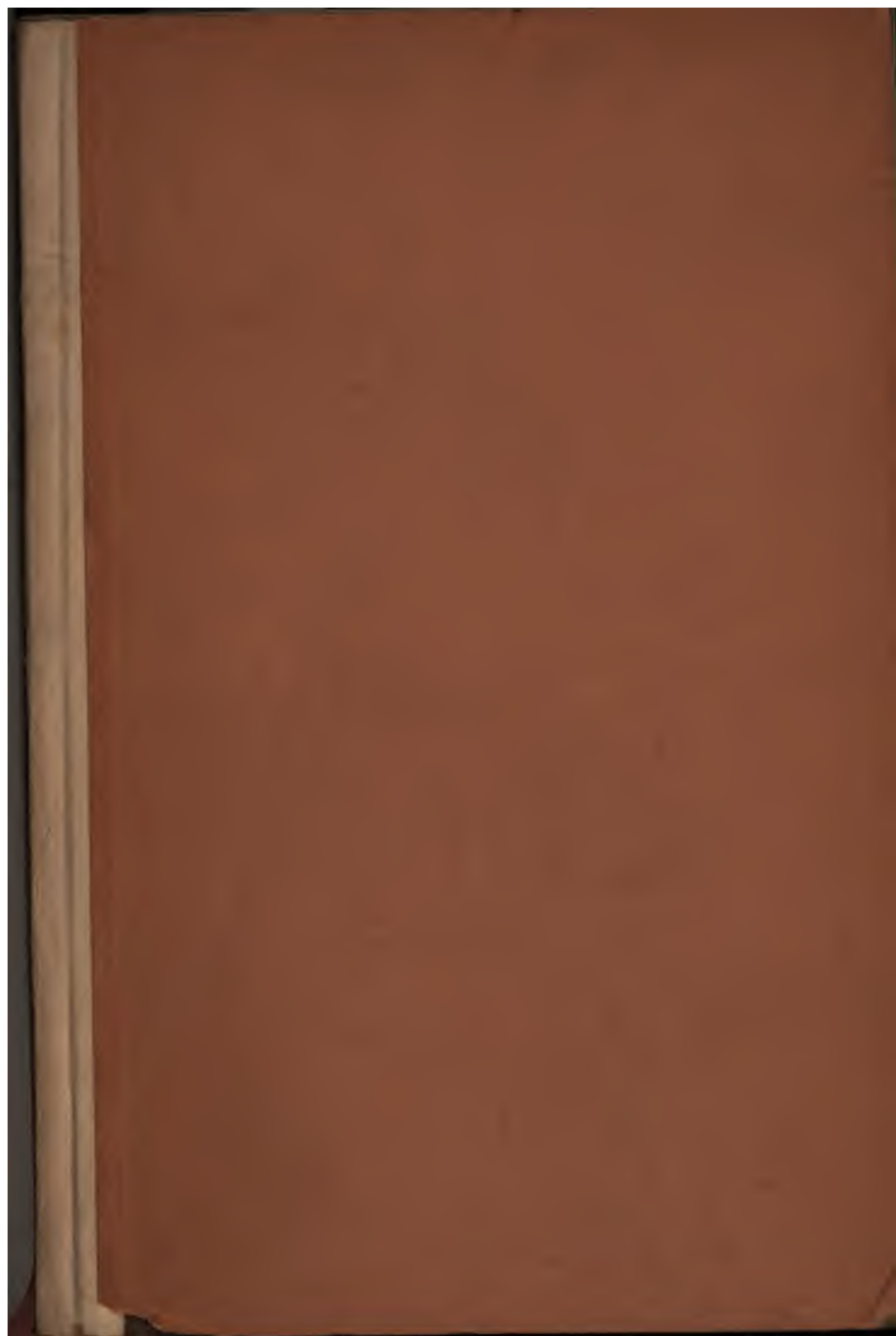
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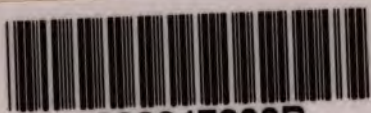
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123.

THE HYGIENE
OF THE
THROAT AND EAR

A POPULAR GUIDE TO
THE CAUSES, PREVENTION, AND CURABILITY
OF THEIR DISEASES

BY
GORDON HOLMES, M.D.

PHYSICIAN TO THE MUNICIPAL THROAT AND EAR INFIRMARY, LONDON; CONSULTING
PHYSICIAN TO THE SHEFFIELD EAR AND THROAT HOSPITAL, ETC.

WITH SEVEN ILLUSTRATIONS

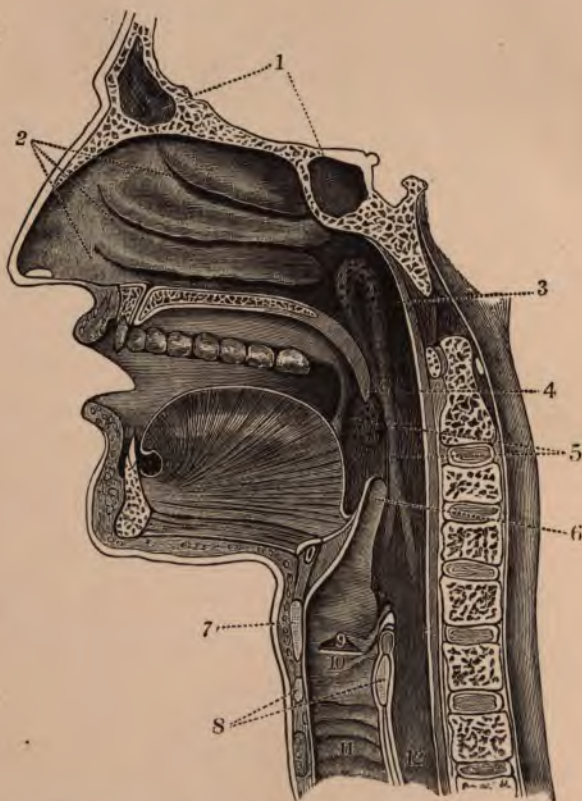


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SECTION SHOWING THE INTERNAL PASSAGES OF THE THROAT
AND NOSE.

1. Cavities in the bones of the head, communicating with the nose (frontal and sphenoidal sinuses). 2. Superior, middle, and inferior meatus of the nose. 3. Orifice of Eustachian tube, leading to middle ear. 4. Uvula. 5. Pillars of the fauces, with the tonsil between them. 6. Epiglottis, or valve covering the entrance of the wind-pipe. 7, 8. Cartilages of the larynx, or voice-producer, divided. 9. Ventricle of larynx. 10. Vocal band. 11. Trachea, leading to bronchial tubes and lungs. 12. Oesophagus, or gullet, leading to stomach.

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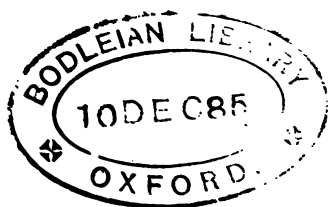
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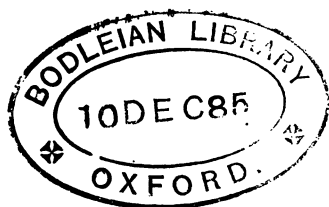
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P R E F A C E.

THE present age may be not unfairly defined as, above all things, an era of sanitary science—as an age in which, both politically and socially, the preservation of health and extension of life are recognized as the foremost practical ends to be aimed at. Within the last quarter of a century the post of Medical Officer of Health has been instituted as an universal necessity, and sanitary engineering has become a special and busy occupation; whilst during the past year we have had a Health Exhibition of unexampled popularity, and an elaborate “Book of Health,” written by medical men, has been published for the instruction of the public.

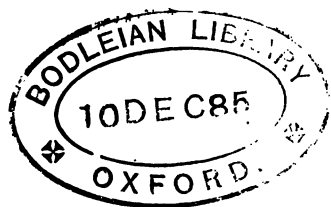
Thus, the venerable *Æsculapius* is in danger of being driven from his throne, even with the collusion of his own disciples, by a younger and more favoured rival, *Hygieia*, the goddess of health. Nor can the philosopher or politician pronounce against this sway, fast becoming despotic, of *Hygieia*; for her right to rule, though not her practical capability, has been allowed from the most distant ages, and her enthronement in the present century is but homage to the incontrovertible truth of the old proverb that “Prevention is better than cure.”



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As a contribution to this new field of activity, from which so great advantages have already been derived, it is hoped that the present work will not be unwelcome. It contains such information respecting throat and ear diseases, especially as to their causes and prevention, as may be of value to persons predisposed to, or suffering from, those maladies.

G. H.

10, FINSBURY SQUARE, E.C.

May, 1885.

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THE HYGIENE OF THE THROAT AND EAR.

PART I.

DISEASES OF THE THROAT: THEIR CAUSES, PREVENTION, AND PRINCIPLES OF TREATMENT.

THE LARYNGOSCOPE AND ITS REVELATIONS.

BUT little was known for certain about the action and function of the various parts of the larynx, in relation to voice and breath, until the practical introduction, some thirty years ago, of the laryngoscope. Many unsuccessful, or rather, perhaps, disregarded attempts to see this organ in vital activity had been made prior to 1854, when Manuel Garcia, a teacher of singing, took up the matter afresh. Ignorant of previous efforts, he derived no assistance from the history of former failures, but, nevertheless, he was the first who perfectly achieved his object. Standing before a looking-glass in the full sunlight he placed a small dentist's mirror in his pharynx, and thus had the good fortune almost immediately to get a view by reflection of his vocal bands, and the other parts of the larynx beneath. Continuing his observations on his own throat, he was, at the end of a year, able to read a paper before the Royal Society on the production of voice by the larynx as elucidated by his invention.* Garcia's device did not, however, attract immediate attention,

* Proceedings of the Royal Society, Vol. vii., No. 13, 1855.

and it was only after the lapse of two years that Johann N. Czermak, a German medical professor, commenced a systematic practice with the instrument on himself and on patients, and showed finally the feasibility and facility of viewing the larynx during life. In the course of his observations he also made the general use of the laryngoscope much easier, by pointing out a simple and scientific method of managing the light.

As soon as Czermak had satisfied himself of the actual value of the invention, he travelled into the chief cities of Europe, and by giving laryngoscopic demonstrations before the principal physicians and surgeons of each town, achieved the introduction of the laryngoscope into medicine as an indispensable adjunct to the local study of disease.



THE LARYNGEAL MIRROR AND FACIAL REFLECTOR.

The laryngoscope, as now used, consists, in the first place, of a small mirror, called the laryngeal mirror, intended to be placed in the pharynx so as to reflect the parts below; and, secondly, of some kind of accessory apparatus for the purpose of throwing

The Larynx as Reflected in the Laryngeal Mirror.

THE LARYNX DURING QUIET BREATHING.

1, 2. Projections of various cartilages. 3. Vocal bands. 4. Ventricular folds.
5. Epiglottis. 6. Trachea.



THE LARYNX DURING ORDINARY SPEAKING.

1, 2. Same as above. 3. Vocal bands. 4. Entrance to ventricles. 5. Ventricular
bands. 6. Epiglottis.

a strong light on the surface of the small mirror. In this country a concave mirror (named the facial reflector, on account of being borne on the face of the observer) is used, by which the light from a good lamp is reflected in a condensed stream into the mouth of the patient. When using the laryngoscope the observer generally causes the patient to protrude his tongue, and holds it out with a small cloth, as by this action the larynx is drawn up higher in the throat, and the epiglottis, which is likely to obscure the view by hanging over the top of the larynx, is also somewhat raised.

The sound of our voice originates exclusively in the action of the vocal bands. When these are drawn close together by the power of the laryngeal muscles, and a current of air is expelled from the lungs through the windpipe, the edges of the vocal bands are thrown into vibration, and a sound is produced on the same principle as when, in playing brass instruments, the lips are compressed together, and a blast of air sent between them. The power of voice thus primarily produced is afterwards much increased by resounding in the cavities of the pharynx, mouth, and nose.

When making muscular efforts with any considerable degree of force, it is necessary that the walls of the chest should be firmly fixed, in order that the muscles attached to the trunk may have a steady base from which to act. This object can only be achieved by confining hermetically the air contained in the chest; and for this purpose the entrance of the windpipe must be tightly closed. Under these circumstances both the vocal bands and ventricular folds are pressed firmly together by the aid of the laryngeal muscles, and the passage of the glottis is thus completely blocked.

During ordinary breathing the vocal bands keep in a continual state of gentle motion to and from each other, thus modifying the size of the glottis in accordance with the varying amount of air which passes in and out of the lungs.

The rapidity and force of respiration vary, in fact, at every moment, and preserve a regular proportion to every motion of the body, whether slight and momentary or strenuous and sustained. This ceaseless activity of the vocal bands can be watched with the laryngoscope to a great extent, as even when the body is in a state of comparative rest the demand on the function of respiration changes incessantly, according to the phases of the circulation and many slight and almost imperceptible alterations in the vital actions, voluntary and involuntary.

The throat is a very common site for diseases arising in the blood or constitutionally to take up a local habitation; but from its exposed situation as the entrance for air and food—everything which is received into the body, in fact—it is also often primarily affected with various maladies. Few diseases of the throat are peculiar to the part as far as regards their intrinsic nature; but, nevertheless, all of them are peculiar from mechanical causes, for the reason that they here interfere with the functions of life in a way, and often to an extent, impossible when they are situated elsewhere. The scope of this work only demands from us an account of such diseases as are tolerably common, with the special aim of pointing out to the lay reader their causes and such hygienic steps as may be taken for their prevention. In describing treatment it will be necessary, of course, as far as practical directions are concerned, to confine ourselves to such methods as are decidedly of a domestic nature; but the general principles of the more skilled and scientific measures will also be set forth, as the intelligent co-operation of the patient with the practitioner has always to be secured by such explanations.

I. THE NASAL CAVITIES.

The nasal canals are remarkably liable to be affected by cold, and most other maladies of the part are the consequence of

repeated colds in the head. In this section we shall speak particularly of—

1. Nasal Catarrh, or Cold in the Head.
2. Chronic Nasal Catarrh and Ozæna.
3. Polyps, or Growths in the Nose.

1. Nasal Catarrh, or Cold in the Head.

Symptoms.—The phenomena of this very common malady are known to almost every one. It is doubtful—in our climate, at least—whether any person escapes suffering from it for even so long as a twelvemonth. In typical cases it begins by a slight sense of dryness and heat, with probably an unusual feeling of clearness in the nostrils. At this time sneezing is very apt to occur, as the air in passing irritates the membrane, divested as it is of its normal moistening secretion. Then usually the familiar remark is made, “You’ve caught a cold.” In a variable but short time, however—from half an hour to half a day—these sensations disappear, and are gradually replaced by more or less headache, feeling of weight in the forehead, with fulness and stoppage of the nostrils, so that breathing has frequently to be carried on altogether through the mouth. Almost immediately that these symptoms become pronounced, a thin watery fluid commences to trickle, drop by drop, from the nose, and the patient makes constant but quite fruitless attempts to clear the nostrils by the use of his pocket-handkerchief. This state of things remains without much change, except that the thin discharge increases considerably in amount as soon as the catarrh gains a firm footing, for a day, a week, or sometimes even a fortnight. Ultimately another change usually takes place, but not always—namely, the discharge becomes somewhat thick and greenish, but at the same time the abnormal feelings in the nose diminish, and nasal breathing can again be carried on with ease. By degrees this discharge loses its peculiar

character, assumes the appearance of ordinary mucus, and thus the health of the part is re-established. In slight instances, however, the last stage is absent, and matters return to their ordinary state in a day or a few days.

Causes and Prevention.—It is only when the causes of a disease are clearly known that we are in a position to attempt its prevention. Nasal catarrh most frequently springs from exposure to a cold draught of air playing on the top of the head—in approaching an open door or window with the head uncovered, for example. The fact of the head being customarily sheltered in the open air, and left quite bare in the house, renders us peculiarly susceptible to such draughts. This susceptibility is often immensely increased in persons who have recently become bald, especially if the natural covering of the hair has been rapidly lost. In such instances an artificial shelter for the head should be adopted, a procedure which offers no difficulty in the case of females; but in the male sex this requirement is not so easily met. For the latter, fashion will only permit, and we are obliged to counsel, the wearing of some kind of wig. The circumstance must not, however, be lost sight of, that such an adventitious protection, once assumed, is likely to become a permanent necessity, as it can only be left off very guardedly without a recurrence of the evil. The best opportunity of dispensing with it is to be found in the summer, whenever for any lengthened period the weather happens to be warm and equable.

Nasal catarrh does not always originate in cold; the passage of any irritating dust or pungent vapour through the nostrils may produce it; *e.g.*, powdered ipecacuanha, dust (probably containing fungi) emanating from old books, fumes of ammonia, muriatic acid, etc., the volatile oil arising from a freshly-cut onion, and many other similar sources. Some persons are peculiarly liable—have an idiosyncrasy—to suffer in this way. Thus Cloquet tells us of persons who were immediately attacked

by a running from the nose, on apples, roses, etc., being brought into the room with them. Nasal catarrh arising in this way, however, is, as a rule, of very short duration, and disappears quickly on the removal of the exciting cause, without passing through the various stages of an ordinary cold in the head.

Treatment.—No malady, perhaps, comes within the domain of domestic medicine—calls on the empirical resources of the housewife—so much as a cold in the head. Hot drinks, putting the feet in mustard and warm water, a mild aperient, are usually resorted to ; and against such simple remedies nothing can be said—they are always harmless, and occasionally slightly beneficial. But in nine cases out of ten the obstinate catarrh refuses to yield an inch, and in the tenth probably only seems to do so through being of more than usual mildness. Nor is the medical profession in possession of any specific which can force this simple but troublesome malady to retire defeated, and hence a wide field lies open here for the pushing of patent nostrums, which will mostly be found as inert as are the majority of medicines of that class.

Nevertheless, the author believes that a cold in the head can, in most instances, be cut short by a simple method, not, indeed, novel or unknown, but still, not clearly recognized, and probably seldom followed. It consists merely in taking a moderate dose of opium at bed-time. This drug, of all others, has the most potent drying effect—that is, checks secretion on the internal surfaces (mucous membranes) of the body. Thus it will often in the course of a night check the excessive nasal discharges, and on awakening in the morning the sufferer finds himself cured. To obtain this result an adult may take from fifteen to twenty-five drops (measured in a graduated glass) of laudanum (tincture of opium) in a little water or otherwise. In the morning after, an aperient will be advisable.

Vigorous blowing of the nose should be carefully avoided, as the obstruction arises chiefly from swelling of the internal parts,

which can only be rendered worse thereby. All that can be done, therefore, in this way to free the passage from the catarrhal flow is to wipe the nose and blow it gently.

2. Chronic Nasal Catarrh and Ozæna.

Symptoms.—Chronic nasal catarrh resembles very much the third stage of the ordinary cold in the head. The nose feels somewhat stopped, and the handkerchief has to be resorted to frequently; but the discharge is seldom watery, being for the most part thin and greenish. It has also a faint odour, not met with in health. These symptoms may last for months or even years, changing somewhat in intensity according to the weather or temperature. Thus the malady sometimes seems almost well in summer, but on the approach of winter returns to its more troublesome state.

In some cases of an aggravated type, the nasal discharges have a fetid smell, which usually also infects the breath of the patient. To this form has been given the name of *ozæna*, which signifies a strong or bad smell.

Causes and Prevention.—This malady mostly arises from repeated attacks of the acute catarrh, by which the internal surface of the nose, frontal sinuses, and antrum become permanently thickened and deranged as to their function of providing the natural secretions of the part. When the disease takes on the form of *ozæna*, there is usually ulceration of some part of the nasal lining, which may be eaten away down to the bone. Under these circumstances, the bone is likely to become carious or rotten, thus rendering the malady more severe and permanent. Matters, however, will seldom proceed so far as actual *ozæna* unless the individual is affected by some kind of cachexia or constitutional taint, notably scrofula.

The occurrence of chronic nasal catarrh emphasizes the

importance of carefully guarding against the repeated attacks of cold in the head, when a liability of the kind appears to have developed itself. More especially is preventive care demanded when the person appears not to be in a general condition of sound health, lest the more formidable stage of ozæna should be reached. The remarks in the last section under this heading should be well borne in mind.

Treatment.—Chronic nasal catarrh cannot be treated efficiently from a domestic point of view. The medical practitioner must be consulted in order that the actual state of the interior of the nose may be ascertained. The laryngoscope has an important application in diseases of the nose, for by turning the face of the laryngeal mirror upwards in a suitable direction when in the pharynx the posterior nostrils can be well seen. It is in the vicinity of these openings that the ulcerations, etc., of ozæna usually occur. The laryngoscope when used in this way is called the “rhinoscope” (nose-observer).

The ordinary principle of treating chronic catarrhal diseases is by the application of watery solutions of astringent or styptic drugs directly to the part with brushes, syringes, etc. Alum and salt are astringents of familiar character, but not so effective as many others less commonly used. These remedies have a drying and contractile action on the mucous membrane, and hence their value in such affections as we are treating of. Of late years a great advance in the treatment of nasal diseases has been made by the invention of the “syphon nasal douche” by Thudichum, of London. This appliance furnishes a means of washing the interior of the nose with whatever solution desirable to be employed more effectually than by any other method. It consists simply of a tube of india-rubber about three feet long, with a nozzle at one end shaped suitably to fit the nostril. The patient proceeds as follows:—Taking a vessel containing about a pint of the solution to be used, he places it with the bottom on

a level with the top of his head on any convenient support ; one end of the tube, to which a small weight is attached, is dropped to the bottom of the vessel, and the fluid must then be made to flow by sucking with sufficient strength at the external and lower end, which is fitted with the nozzle ; at the instant the liquid is felt to have run down, it can be restrained by closing the tube near the end by pressure of the fingers ; then the nozzle being accurately applied to one nostril, the solution is allowed to enter the nose, the patient breathing meanwhile through the mouth ; thus the solution, having coursed through the nasal channels, runs out again by the other nostril, and is received in a basin below ; the pint of fluid is enough for one application, and the process is usually carried out twice a day, morning and evening.

Many cases of chronic nasal catarrh may be cured simply by using the douche twice daily, the solution consisting of a teaspoonful of common salt in a pint of water. Plain water must not be employed, and if the douche causes a feeling of fulness in the ears, running from the eyes, and other disagreeable symptoms, it is probably unsuited to the particular case, and should not be persevered in without medical direction.

In cases of *ozæna* depending on dead bone in the nose, a surgical measure for removing the offending pieces is usually required.

3. Polyps, or Growths in the Nose.

Symptoms.—Obstruction of one or both nostrils is the leading phenomenon of this disease, but a state of chronic catarrh is also kept up by the irritating presence of the abnormal substance. Sometimes the polypus is so near the front that it can easily be seen by looking into the nostril in the ordinary way, but as a rule it is more deeply seated, and can only be detected by using a dilating nasal speculum, and throwing a bright light into the nostril with the facial reflector of the laryngoscope. The

commonest kind of nasal polypus is called the mucous or gelatinous polyp, being composed of a jelly-like and watery substance, and having a semi-transparent or translucent appearance with a bluish-white colour. Growths of a much more solid nature, called fibrous polypi, are occasionally met with. These being of a dense, unyielding consistence may, if they attain to a large size, give rise to a painful sense of fulness, and even cause deformity of the nose and cheeks by pressing the surrounding bones out of place.

Causes and Prevention.—The origin of this disease is somewhat obscure, but in a great many cases the occurrence of the gelatinous polyp can be traced to numerous attacks of colds in the head. But the fibrous growth cannot be clearly connected with such an origin. As regards prevention, therefore, we must refer back to what has been said in treating of simple nasal catarrh, beyond which no definite advice can be given.

Treatment.—By the application of astringent solutions, some palliative benefit can often be obtained in the case of nasal polyps—that is to say, the condition of chronic catarrh which accompanies them can be more or less alleviated. To gain permanent relief, however, the growth must be removed by some means, generally by seizing the root with a pair of forceps or a wire snare, and plucking it out. As this operation can be done very rapidly, the pain, though sharp, is but momentary. For some days or weeks afterwards the root of the polyp requires to be treated with caustics and astringents, as otherwise the growth is apt to sprout afresh, and in a short time attain its original size. When the polyps have reached a large size, especially if they are fibrous, more complicated surgical procedures are often necessary in order to clear the nasal cavities of them.

Another method, invented by Bryant, of London, for curing the gelatinous polypi, may often be adopted with success. It consists in causing them to shrivel up into a small bulk by

injecting into their substance a solution of tannin (tannic acid), by means of the needle or hypodermic syringe. This substance is the active principle of the barks used by tanners for converting skins into leather. It acts similarly on the loose gelatinous tissue of the polyp, which when thus hardened does not occupy a quarter of its original space. The operation is scarcely painful, but may have to be repeated several times.

The importance of seeking advice early in case of any nasal obstruction of recent date must be strongly impressed on the patient, as otherwise he may have to undergo a severe operation, and suffer from some permanent disfigurement.

II. THE PHARYNX.

The diseases of this part which we shall describe here, are —

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2. Enlarged Tonsils.
3. Chronic Catarrh of the Pharynx.
4. Diphtheria.
5. Enthetic Disease.

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Causes and Prevention.—The origin of this disease is somewhat obscure, but in a great many cases the occurrence of the gelatinous polyp can be traced to numerous attacks of colds in the head. But the fibrous growth cannot be clearly connected with such an origin. As regards prevention, therefore, we must refer back to what has been said in treating of simple nasal catarrh, beyond which no definite advice can be given.

Treatment.—By the application of astringent solutions, some palliative benefit can often be obtained in the case of nasal polyps—that is to say, the condition of chronic catarrh which accompanies them can be more or less alleviated. To gain permanent relief, however, the growth must be removed by some means, generally by seizing the root with a pair of forceps or a wire snare, and plucking it out. As this operation can be done very rapidly, the pain, though sharp, is but momentary. For some days or weeks afterwards the root of the polyp requires to be treated with caustics and astringents, as otherwise the growth is apt to sprout afresh, and in a short time attain its original size. When the polyps have reached a large size, especially if they are fibrous, more complicated surgical procedures are often necessary in order to clear the nasal cavities of them.

Another method, invented by Bryant, of London, for curing the gelatinous polypi, may often be adopted with success. It consists in causing them to shrivel up into a small bulk by

injecting into their substance a solution of tannin (tannic acid), by means of the needle or hypodermic syringe. This substance is the active principle of the barks used by tanners for converting skins into leather. It acts similarly on the loose gelatinous tissue of the polyp, which when thus hardened does not occupy a quarter of its original space. The operation is scarcely painful, but may have to be repeated several times.

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Causes and Prevention.—Tonsillitis arises from taking cold, usually from exposure to wet and cold, but the malady rarely proceeds to the acme of severity unless the person attacked be markedly out of health. Many people have a peculiar proclivity to suffer from sore throat, especially young persons in their “teens.” This predisposition lessens gradually with age, and, in fact, after forty quinsy is a decidedly rare disease. During early life the liability to suffer increases after, perhaps originates fortuitously from, one or two attacks; the slightest cold, as it is often expressed, flies to the throat.

Beyond the ordinary precautions against taking cold, the avoidance of quinsy lies exclusively in the sphere of attention to general hygienic laws. Regularity of life, healthful exercise, shunning of all debilitating excesses (late hours, overwork, free indulgence in alcoholic liquors, etc.), pure air, and in the case of young people affected with general delicacy (scrofula) or special liability, tonic medicines, change of air, sea-bathing, and cheerful mental pastime are the principles to be assiduously acted on.

Treatment.—The slighter class of cases, if attended to at all, are almost invariably treated by the homely methods of hot drinks and mustard in warm water to the feet at bed-time, whilst a flannel bandage is wrapped round the throat, and an aperient dose taken. *Macte virtute esto!* we may exclaim to the housewives, at the same time that we indicate a couple of simple remedies likely to be valuable in their domain. Astringent lozenges, of rhatany or tannin, one or two taken slowly every hour or half-hour, or small pieces of ice kept frequently in the mouth and swallowed as they dissolve, will usually cure an ordinary sore throat in the course of twelve or twenty-four hours.

When seen at the onset the practitioner often succeeds in cutting short moderately severe cases of quinsy by administering aconite or guaiacum in suitable doses—drugs which have a specific power in this malady. In all cases warm poultices applied to the outside of the throat and sucking of ice are advisable. When an abscess has formed, immediate relief to the distressing symptoms can be obtained by opening it with a proper cutting instrument, a proceeding rapid and almost painless, unless opening the mouth to the necessary extent gives pain.

Debility remaining after severe tonsillitis is combated by a generous diet, tonic treatment, change of air, etc.

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breathing, is thus explained ; for, as the passage near the back of the nose is much obstructed, respiration has usually to be carried on by the mouth alone, whilst during sleep the tongue is naturally drawn backwards so as wholly or partially to close the entrance to the pharynx, and hence breathing can only be carried on by a kind of struggle between the tongue and palate, which are opposed to each other. When the tonsils are much enlarged, the impediment to free respiration injuriously affects the health of the child, and may even cause a deformity of the chest walls (the ribs) by the abnormal strain which is placed on the still soft bones, in order to force the air in and out of the lungs.

Causes and Prevention.—In young children, enlarged tonsils are altogether a local development of the scrofulous or strumous cachexia. Later on, though always allied to a constitutional taint, they may be more immediately caused by repeated attacks of quinsy of the less severe type.

Children become scrofulous either by inheriting delicacy from their parents, or by improper rearing. When not sufficiently nursed by their mothers in the first few months after birth, when arrowroot, cornflour, and probably preserved milk are relied on for their total nourishment during the first year, they are almost certain to acquire the strumous taint. If the mother's resources are scanty, and a wet-nurse is not obtainable, fresh cow's milk, diluted with half its bulk of water, and strengthened with powdered oatmeal—the last ingredient very sparingly for the first six weeks, but afterwards steadily increased—is the most promising diet for the infant.* Scrofulous children are generally pale, flabby, and bulky, but deficient in muscular strength, with swelled glands in the neck, which at

* Cow's milk often irritates the bowels of infants, producing more or less diarrhoea, with green discharges. Meat should be given very cautiously till twelve or fifteen months have passed, as it causes the disease known as *ricketts*, which is evidenced by swellings of the joints.

some time in the first ten years of life are likely to suppurate, ulcerate, and become open sores, constantly discharging matter (the King's evil). The tonsils, however, are sometimes much enlarged at an early period, with little or no further evidence of the strumous habit.

The restoration of scrofulous children to sound health is to be achieved by a carefully regulated and nutritious diet, plenty of sea-air, and of sea-bathing if well borne, but above all things by the continued administration of cod-liver oil. Dr. de Jongh's "light-brown" oil is usually considered by medical men to be most efficacious, on account of containing a larger amount of *iodine*. The purifying action of iodine in certain combinations on the animal economy surpasses that of any known drug; and this, taken in conjunction with the great nutritive and tonic properties of Dr. de Jongh's oil, explains the stability and popularity of its position in medicine.

Treatment.—If the enlargement is pronounced, the tonsils—that is, the greater part of them—should be excised. This operation can be performed by an American instrument, specially devised for the purpose, now in world-wide use. It occupies but a moment, is devoid of danger, and is, on the whole, a less painful and disagreeable operation than, for example, the extraction of a tooth. Not unfrequently one tonsil only requires excision.

When the enlargement is not very great, applications of astringents and caustics, persevered in for several weeks, often effect a sufficient reduction of the size.

3. Chronic Catarrh of the Pharynx.

Symptoms.—In this case we have a continual soreness of the throat, variable in degree from time to time, always more or less troublesome, but seldom or never decidedly painful. The disease affects the surface of the pharynx in the whole or greater part of its extent, and the mucous membrane appears

redder, and often rougher than in health. A flabby, somewhat raw-looking state of the soft palate, uvula, and tonsils is generally present, which is commonly called relaxed throat. In some instances the back of the pharynx, especially up towards the posterior nares, is very dry and sore, a condition particularly designated as post-nasal catarrh. When small elevations are present we have the variety termed granular pharynx, or follicular throat disease.

Causes and Prevention.—This affection may be the result of frequent slight colds in the throat, or of one or two well-developed attacks of quinsy. As a rule, however, it originates in an entirely different way—that is, from habitually breathing directly through the mouth instead of by the nose. Thus it is very likely to supervene when the latter organ is obstructed through disease. But although the nose may be free from any positive malady, it not unfrequently becomes blocked by a congestion or turgescence of a number of large veins situated near the posterior nares, which are likely to become distended during sleep from causes connected with the equalization of the circulation of the blood. Such, probably, is always the cause of snoring, which can only occur when the mouth is partially open. Under other circumstances, however, breathing through the mouth is often improperly and excessively resorted to, namely, in public speaking or in singing. Here, indeed, the habit may sometimes be necessary, but only to a slight extent, for the speaker can almost always, and the singer most frequently, dispense with it.

We cannot exaggerate the physiological importance of breathing through the nose—of respiring naturally, we may say—even if the air were perfectly pure; and the knowledge, moreover, that it is crowded with germs, more or less harmful, often, indeed, being the veritable seeds of fatal disease, must impress us still more forcibly with the hygienic weight of the direction, “KEEP YOUR MOUTH SHUT.”

Smoking excessively, particularly if the person has to eject much saliva, is another cause of chronic soreness of the pharynx. The mucous membrane of the part is rendered dry at the same time that it may be irritated by the acidity and heat of the tobacco smoke. Strong and hot cigars are undoubtedly the most injurious. Hence, in this direction another preventive indication is afforded.

Treatment.—The first consideration is to get rid of the habit of breathing through the mouth, if it has been ascertained to exist. When the patient is fully alive to the desirability of keeping the mouth closed, he may even gradually acquire a command over himself in this respect during sleep. If successful, the catarrh will in many cases disappear without further measures.

In most instances applications of medicaments locally with a brush are required. Mild caustics may also have to be used before the mucous membrane can be restored to a healthy state. Inhalations of the steam of hot water, medicated with volatile oils, etc., or astringent solutions inhaled in an atomized form from a spray-producer, are often an essential part of the treatment.

4. Diphtheria.

Symptoms.—More or less knowledge of this serious and often fatal malady is familiar to most members of the public. Beyond the usual signs of sore throat, the characteristic feature, from which it takes its name, is the presence of a whitish film, pellicle, or false membrane, in the inside of the throat. Although diphtheria, commonly so called, has its prime seat in the pharynx, it may extend upwards into the posterior nares, or downwards into the windpipe. In the latter case there is always imminent danger of suffocation, on account of the larynx or trachea being obstructed so as to prevent the passage of the breath in proper quantity. In children, in fact, diphtheria

almost invariably attacks the windpipe, and the disease is then called croup. Owing to this peculiar distinction of site, diphtheria, as seen in the adult and in the child, was, until late years, regarded as two separate maladies.

Accompanying the local manifestations of diphtheria there is always great constitutional disturbance, and the prostration of the patient is sometimes so marked that, without respiration being at all impeded, he dies of weakness or collapse.

Causes and Prevention.—Diphtheria is apparently a disease of modern times. No clearly recognized cases in the adult are known to have occurred until the present century; whilst croup, though described somewhat earlier, can still scarcely be traced back for more than one hundred and fifty years. The actual origin of the disease is involved in obscurity; it seems to be always in existence sporadically—that is, rare, isolated cases are continually occurring, but in its full development it appears in form of an epidemic, like cholera, though never so widespread, and ravages whole towns, villages, or districts, for several weeks. Hence it probably arises from some poison (fungus, microbe, bacillus perhaps) which, whatever its primary source, at times permeates the atmosphere, and thus infects the blood by entering the lungs with the breath.

As regards prevention, it appears evident that diphtheria is fostered, if not actually generated, in unhealthy houses, where the air is contaminated through inefficient drainage. Like all other maladies, especially epidemics, it will affect by preference persons who are out of health, whose vitality is not vigorous enough to repel the onslaught of the poison, whose blood in such case forms a suitable breeding-ground for the morbid germs. It must be remembered also, that during the rage of epidemics those persons are more prone to succumb who allow themselves to be influenced by nervous fear of taking the malady, not indeed for any purely psychological reason, but simply because such fears lower the tone of the body and create a debilitated

state of health. Hence the necessity under such circumstances for cheerful occupation, preventing the mind from dwelling on distressing incidents, etc.

Treatment.—No actual specific for the cure of diphtheria has yet been discovered, but no doubt life is often saved by judicious measures. Treatment by tonics (especially iron and Peruvian bark or quinine), and supporting the strength of the patient by a light and nourishing diet (beef-tea, etc.), with a small amount of good wine is mainly essential. Sucking ice is generally beneficial.

Locally, applications for the purpose of dissolving away the false membrane may be resorted to, but no wholly successful medicament possessing this action is yet known. Dilute muriatic acid, or solution of chloride of soda (Beaufoy's), may do good service in this way. Quite recently a vegetable extract named *papain*, introduced by Dr. Finkler, of Bonn, has been employed, in some cases with unusually satisfactory results, but the general experience of the medical profession has yet to confirm its value. Many remedies, indeed, have been vaunted from time to time, but only to fall into disuse after an extended trial. In epidemics, diphtheria, like other maladies that so occur, is most virulent at the outset, and a great majority of the first cases are fatal, but gradually the poison seems to become weaker, and the recoveries increase proportionately. Thus the practitioner, who has been varying his treatment in despair, is apt to be misled towards the close of the epidemic, so as to suppose that the diminished mortality is due to the efficacy of his latest method.

In croup the operation of opening the windpipe (tracheotomy) sufficiently low down to allow breath to be taken below the obstruction, or perhaps to extract some of the offending substance, sometimes saves life.

5. Enthetic Disease.

Symptoms.—This is a constitutional malady which manifests itself locally in various parts of the body, but nowhere more frequently and violently than in the throat. It consists in ulceration, often rapid and deep, which may extend up to the posterior nares or down to the larynx. Frequently large holes are eaten through the soft palate; the bones of the nose, the base of the skull, backbone, etc., are laid bare, and thus become carious or rotten, so as to keep the deep and extensive ulcers open whilst they give exit to foul and offensive discharges. In the larynx and trachea the malady may cause suffocation by producing considerable swelling as well as the other ravages. If the vocal bands are ulcerated much hoarseness arises, and even complete loss of voice if they are in great part eaten away. A fatal termination is, however, comparatively rare.

Causes and Prevention.—The records of this disease seem to indicate that it only originated by some means in the thirteenth century. It arises from a morbid poison, which makes its way into the blood after intimate contact with some person previously infected. As regards prevention, beyond individual caution to keep away from infection, this is a matter that can only be achieved by the universal and careful enforcement of the Contagious Diseases Act.

Treatment.—Certain drugs are fortunately known which are almost specifics against this disease. The first is mercury, in its various salts, which was formerly the only one recognized, but it was given to such an extent that much serious illness often resulted from its excessive use. Now, however, by being administered very guardedly the greatest success often attends its action. The other drug is iodine, especially in the form of iodide of potassium, a remedy only discovered about fifty years ago by Copland, of London. Being almost harmless and very effective it has almost taken the place of the mercury, though

the use of both is often required. For the treatment of the ulcerations local applications of astringents, caustics, etc., are of course generally demanded.

III. THE LARYNX AND TRACHEA (WINDPIPE).

In this section we shall make the following divisions:—

1. Acute Inflammation of the Larynx.
2. Chronic Catarrh of the Larynx.
3. Paralysis of the Muscles of the Larynx.
4. Polyps, or Morbid Growths in the Larynx.
5. Laryngeal Phthisis (Throat Consumption).
6. Cancer of the Larynx.
7. Foreign Bodies in the Windpipe.

1. Acute Inflammation (Œdema) of the Larynx.

Symptoms.—Shortly before, or simultaneously with the occurrence of this malady, general feverish symptoms set in. There is a sensation of swelling or obstruction, with stiffness, in the inside of the throat; also more or less pain in swallowing or speaking. Pressure on the larynx externally, or Adam's apple, is at the same time somewhat painful. Alteration of voice takes place, not hoarseness properly so called, but the vocal tones may become deep and abrupt, or weak and shrill. Not unfrequently, indeed, the patient is unable to speak above a whisper. There is always some difficulty of breathing, and when the case is severe respiration has a wheezing or whistling sound; whilst at every moment the patient appears and feels in imminent danger of suffocation, which often does prove fatal.

On looking into the larynx with the laryngoscope, the observer perceives a variable amount of swelling of the organ, general or partial, and the glottis or space between the vocal bands appears unusually narrow, owing to those bands being pressed towards each other by the tumefied parts around.

Causes and Prevention.—Edema of the larynx arises from exposure to wet and cold, and there is a special liability to it in taking cold from wet feet. It may also occur from direct injury to the larynx through the swallowing of some caustic or corrosive fluid, such as sulphuric acid, strong solution of ammonia, etc. Mistakes with respect to liniments, etc., intended for outward application only, have caused death in this way. Children have often suffered from the disease through ignorant attempts to swallow hot or boiling water, as from the spout of a kettle, for instance. In adults, when the malady is excited by cold, it is not likely to run a severe course, unless there has been a previous derangement of health. Such special precautions as can be taken against its occurrence will naturally be deduced from this account of its causation.

Treatment.—As the danger lies in suffocation being threatened by closure of the windpipe, the local measures to be adopted are of the foremost importance. The swelling of the larynx must be relieved immediately on any serious difficulty of breathing supervening. The first procedure is to make a number of small cuts (scarifications) in the larynx, to allow the fluid which causes the swelling to ooze out. This operation can be effected by the aid of a small lancet mounted at the end of a long curved stem, and the laryngeal mirror, with which the operator follows and guides his actions. If sufficient relief cannot be given in this way, an artificial opening must be made in the windpipe below the larynx (tracheotomy), so that the patient may breathe in that manner until the inflammation and swelling above have subsided. General prostration of strength, which is very often occasioned by this disease when severe, must be guarded against by suitable sustaining measures.

2. Chronic Catarrh of the Larynx.

Symptoms.—This affection may vary very much in degree; hence the symptoms will present considerable difference in

diverse cases. The patient has a perception of thickness in the lower part of the throat, often with a sense of heat and very slight soreness; more rarely there is a troublesome pricking or smarting. The chief point is, however, that the throat never feels clear, a slight obstruction continually exists at the upper part of the windpipe (about the glottis), which causes, but cannot be got rid of by, repeated hacking efforts at coughing. Voice, in addition, is always very perceptibly influenced; in the milder instances there may be only a veiled or muffled state of the vocal tones, occurring on rising in the morning, and wearing away for the most part as the day advances. But in fully-developed cases a pronounced rough hoarseness is permanently present, whilst voice-production is laboured, and all sonority is lost. In females of a nervous or delicate type, the malady often occasions aphonia, or loss of voice—that is, the patient can never speak above a whisper. In the worst cases, after the symptoms have lasted unabated for months or even years, constitutional debility is usually engendered, and thus in an indirect way life may even be abbreviated.

Causes and Prevention.—There are distinctly three classes of this malady, *i.e.* :—

a. Mild cases, which occur in connection with frequent but slight colds, which are often caused by leaving off customary wrappings about the throat, and sometimes even by shaving the chin, etc., after long disuse of the habit. Here again we may revert to habitual breathing with the mouth open as a cause of disease, especially if the person be repeatedly exposed to an atmosphere loaded with irritating particles of dust, as may happen in drug stores, in the employment of sandpapering, etc.

b. In a second category of instances the condition is similar to that found in “granular pharynx.”* The small glands of the larynx, which have the office of keeping the surface moist, are in a state of swelling and slow inflammation. This is the

* See p. 18.

affection, in fact, commonly called "clergyman's sore throat;" for it arises, as a rule, from over-use of the voice in public speaking, not unfrequently even in singing. Breathing excessively by the mouth is in this case also undoubtedly the chief exciting cause; but the disease is predisposed to by any constitutional weakness. The troublesome pricking sensations are peculiarly associated with this form of laryngeal catarrh.

c. The very severe examples of chronic catarrh of the larynx, almost invariably occur in persons who are incessantly obliged to strain the voice in shouting, *e.g.*, auctioneers, costermongers, etc., or in those who are habitually exposed to wet and cold—cab-drivers, for instance. But although all these circumstances favour the generation of the malady, I am inclined to believe that the real and fundamental cause of it is in conjunction with the customary abuse of alcoholic liquors. "The voice," as Brouc* sagaciously observes, "is the hygrometer of sobriety;" and every one knows that the first symptom of intoxication is a thickness of speech, which arises not merely from a loss of command over the muscles of the tongue, etc., but also from a congestion or fulness of the inside of the throat. Such congestion often repeated has a tendency to become permanent, and when the voice at the same time regularly undergoes a daily strain, matters progress to permanent and aggravated disease.

The prevention of chronic catarrh of the larynx consists, therefore, in guarding against any persistent, though perhaps trivial, cause of taking cold in the throat, careful attention always to breathe through the nose, especially in an atmosphere containing foreign matter of any kind, judicious management of the vocal organs in speaking and singing, and finally, in the practice of strict sobriety.

Treatment.—The main consideration is, of course, to do away with the exciting cause of the disease, if such can be dis-

* "Hygiène philosophique des artistes dramatiques." Paris, 1836, tom. ii. p. 109.

covered. Treatment of the part affected must then be assiduously carried out, in a degree proportionate to the severity of the case. Warm, soothing inhalations and astringent lozenges are generally of much benefit. The most efficient measure is, however, the regular application of astringent solutions and mild caustics to the larynx by the aid of the laryngeal mirror, and a brush with a handle of suitable length and curve.



LARYNGEAL BRUSHES.

Change of air, especially with a course of treatment by mineral waters, etc., at the health-resorts of Aix-les-Bains, Marlioz, or Mont Dore, will always be serviceable, and often complete the cure.

3. Paralysis of the Laryngeal Muscles.

Symptoms.—As there are two sets of muscles in the larynx, viz., those which draw the vocal bands together and close the glottis for voice-production and for holding the breath, and those which move the same bands widely apart so as to admit a copious current of air for respiration, so there are two kinds of laryngeal paralysis.

a. When the first set of muscles are paralyzed and the vocal bands cannot be closely approximated, loss of voice is the natural result, and the patient can only speak in a whisper.

This kind of paralysis is, as a rule, however, very incomplete, and though the sufferer cannot sound the voice, yet he can cough and hold the breath without any difficulty. Beyond the inconvenience the malady is rarely significant.

b. The vocal bands, when not pulled either way by any muscles, remain naturally at a certain distance from each other, sufficient to allow of quiet breathing without sensible impediment whilst the person is at rest. But during active exercise, and even in moving about for the most ordinary requirements, long breaths have to be taken, and for this purpose the vocal bands must be separated widely by the action of special muscles. When these muscles are paralyzed, which fortunately happens but rarely, a distressing obstacle to free breathing is at once felt, and very moderate exertion causes alarming shortness of breath. As the disease continues, the muscles which close the windpipe, through never being stretched to the full, grow unnaturally rigid, and contract progressively until they cause the vocal bands to be fixed permanently so near to each other that, even when in a passive state, the person feels in immediate danger of suffocation. Thus, in a few months, if relief is not afforded, an actual fatal result may ensue.

Causes and Prevention.—Cases of loss of voice are almost confined to females of a nervous temperament or delicate constitution. In such subjects the affection very often accompanies the milder forms of catarrh of the larynx, but often also arises without any obvious cause, apparently dependent merely on a want of nervous energy and resolution. It often appears without notice, and shortly disappears as suddenly, no cause for its existence being discernible but merely want of force of will, seemingly even of desire to speak. Frequently, under the influence of a little pleasurable excitement, the voiceless patient unexpectedly comes into possession of her full tones, and not seldom, indeed, seems able to regain her voice by making a

mental effort whenever circumstances render it particularly desirable that she should be able to speak. Hence aphonia of this type mostly belongs to that class of maladies included in the general term *hysteria*, where certain symptoms appear, often of an aggravated character, without any structural disease of the body being discoverable to account for them. Hysteria comprises, therefore, a number of unaccountable psychological phenomena, simulating disease, generally supervening unexpectedly, and in a variable time passing away as suddenly without leaving any positive traces of their existence.

The prevention of hysterical affections, which, nominally and almost practically, are confined to the female sex, lies in providing constantly cheerful occupation and healthful recreation for those likely to become the subjects of them. Strength of will and habits of energy must be cultivated by promoting an active interest in the affairs of life, and furnishing a definite object to be aspired to and worked for. Hysteria and its near relation, hypochondria, are the offspring of a languid and aimless course of life, where mind and body become the prey of rust and decay through disuse and non-performance of the functions for which they have been designed. Stimulate the listless hypochondriac into exertions to distinguish himself in some of the dominating pursuits of life, and his fancied ailments vanish from his perceptions like a nightmare on awaking from sleep.

The causation of the form of laryngeal paralysis in which the breathing is affected is of an abstruse pathological nature, and no proximate precautions that may be taken for its prevention can be mentioned, beyond compliance with the general rules for maintaining health.

Treatment.—In ordinary cases of loss of voice through paralysis of the larynx, the preventive measures are chiefly those which are likely to be effective in promoting a permanent cure. In addition, a course of tonic treatment is usually re-

quired, but in most instances general means may long be unavailing as to the absolute restoration of voice, unless we cause vigour to return to the laryngeal muscles by appropriate local stimulants. For this purpose galvanism is by far the most potent remedy, and by its aid the voice may often be well restored in a short time; in the less obstinate cases, indeed, in a day or a few days. The current is applied by placing a collar round the neck and touching the larynx inside with a curved wire suitably mounted, an instrument called the laryngeal electrode, the device of Mackenzie, of London. Both collar



MACKENZIE'S LARYNGEAL ELECTRODE AND COLLAR.

and electrode communicate with a galvanic battery by which the electric current is generated. When the patient has been able to retain her voice for a week or two, having been caused in the meantime to exercise it regularly by reading aloud, etc., change of air and scene is the most fitting termination for the treatment.

The respiratory paralyses are rather unpromising cases, and in most instances do not get well. As the general health, however, is usually unaffected, life can be indefinitely prolonged by performing tracheotomy—that is, by making an artificial opening in the windpipe below the larynx, to allow of free breathing.

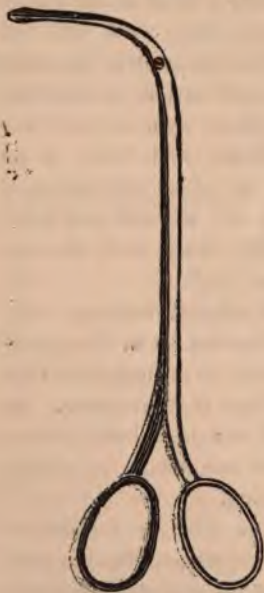
4. Polyps, or Morbid Growths in the Larynx.

Symptoms.—As these growths vary very much in size and position within the larynx, the symptoms attendant on them vary in proportion. A very small polyp or wart on the edge of one of the vocal bands will be likely to cause considerable hoarseness, whilst in that situation one of any degree of bulk may prevent the closure of the glottis, and thus allow only of speaking in a whisper. Moreover, when the growth is really large it may threaten and even cause suffocation, by blocking up the opening of the windpipe. Serious symptoms of the latter kind may also supervene suddenly with little or no previous warning; for, as the growths are often attached by a more or less slender stalk, they may be very movable and liable to shift their place from various slight causes, such as a fit of coughing, unusually active exertion, etc.

On the other hand, as polyps have no intrinsic tendency to be painful, a growth of some size, which does not get in the way of breath or voice, may exist in the larynx for an indefinite time almost without the patient being conscious of its presence. As a rule, however, there is a sensation of a foreign body, a lump, is felt to a greater or lesser extent in swallowing, or a slight flapping motion is perceived in breathing.

Causes and Prevention.—Polyps often arise in the larynx without any evident reason to explain their growth, but ordinarily they are clearly connected with some persistent irritation of the organ, as chronic catarrh or those causes which induce it. Over-work of the voice is the best ascertained incitement to their production, and statistical researches show that a large proportion of cases occur in members of voice-using professions or occupations. Thus, out of 589 instances that have been published 93 persons of this class were affected. For advice as to preventive measures we have, therefore, to refer to what has already been said in treating of chronic catarrh of the larynx.

Treatment.—If the growth gives serious trouble it must be removed bodily from its site. Formerly this requirement could only be executed by the rather dangerous operation of laying the larynx completely open by dividing its anterior wall, in order to get at the polyp, though, indeed, very few cases were recognized during life, owing to the impossibility of seeing the part. Since



LARYNGEAL FORCEPS.

the invention of the laryngoscope all this has been changed; the polyp is immediately seen in the laryngeal mirror, and it can be extracted by the natural channel without pain and without danger. For this purpose long curved forceps are used, by which the growth is seized and pulled out. Sometimes merely crushing it by a strong squeeze of the forceps destroys its vitality, and soon after it comes away of itself. To allow of the extraction of a polyp the patient must be very steady, and in most cases, as the slightest touch of the forceps causes cough, etc., several attempts have to be made on different days, until he, by practice, becomes able to tolerate the introduction of the instrument.

Recently the active principle of coca, *cocain*, has been used with success to produce a temporary loss of feeling in the larynx, so as to facilitate operations of this kind.

5. Laryngeal Phthisis (Throat Consumption).

Symptoms.—This is almost the most serious disease of the larynx, and is analogous to consumption of the lungs, with

which, in fact, it is generally, if not always, associated. At first the symptoms resemble those of chronic catarrh of the larynx, but in a variable time, often in a few months, the patient begins to suffer from great hoarseness, or even loss of voice, pain, and difficulty of swallowing, and more rarely from obstruction of breathing. At the same time constitutional weakness sets in, there is loss of appetite, and ultimately a fatal result ensues from debility.

In this disease the larynx becomes much swollen, and then ulceration spreads widely and deeply, until a great part of the organ is eaten away. In this way one or both of the vocal bands may be destroyed and the production of vocal sound rendered impossible.

Causes and Prevention.—Every member of the public has probably heard during the last few years of the tubercle bacillus, a microscopic fungus discovered by Koch, of Berlin. Animals inoculated with this microbe quickly die of pulmonary consumption, and it appears probable that human beings obliged to respire an atmosphere laden with the organism might succumb in a similar way. As the lungs of consumptive persons are proved to be charged with the bacilli, the rooms occupied by such patients are likely to become infected, and the disease might thus be communicated to individuals not previously affected.

With the exception, however, of the existence of the bacillus in the diseased parts, nothing of this is absolutely proved; at least, it is as certain as ever that persons in sound health do not become a prey to consumption, and that the constitution must be naturally feeble, or ill-health from long acting, and obvious causes must be present before the bacillus can, if at all, create the disease with which it is associated in the human subject.

The causes of consumption have long been practically well known, and the discovery of the bacillus has not disturbed the well-founded belief that where scanty food and clothing, impure

air from bad ventilation, and tedious sedentary employment form the conditions of life, examples of the malady will always be numerous, whilst a population living under opposite circumstances will rarely present an instance. It must be remembered, however, that the ills of poverty are not the only ones that have the power to breed consumption. Protracted studies, exhausting excesses of any kind, profligacy, habitual drunkenness, etc., may either attract the malady to the actual subjects, or, in the case of parents, transmit the morbid tendency to their offspring, especially in the form of scrofula.

The preventive measures naturally follow from the above considerations, but as there is now good reason to believe in the ineffectiveness of consumption, special precautions should be taken to prevent healthy persons from being much in the same rooms with those already diseased. Particularly, provision should be made against sleeping in the same bed, or even apartment, with a consumptive patient, as it is in this way that the most obvious examples of the disease having been communicated have occurred.

Treatment.—The treatment of consumption may be summed up very briefly. Pure air, change of air, and cod-liver oil constitute the system through which cures may be effected when the malady has not advanced too far, and life may be prolonged when it has reached its later stages. Gentle exercise and quiet recreation should be carefully provided for, and, above all things, the invalid should keep as much out of doors as possible—should literally, in fact, live in the open air as far as ordinary precautions and mode of civilized life will allow. The severe trials of “winter and rough weather,” with brusque variations of temperature, should be systematically avoided; and with this view it is the well-known custom in this country for persons with delicate lungs to migrate southwards at the approach of the inclement seasons, so as to enjoy as far as possible a perpetual summer. Of recent years, how-

ever, the belief that consumptives absolutely required a warm climate has been exploded, and it is recognized that *pure air with equable weather* are the actual requisites. With these attributes even a cold locality is most beneficial, and such a place has the further advantage that the bracing action on the body of a cool atmosphere allows of prolonged exercise, if taken judiciously, according to the strength, without lassitude and fatigue. Hence, within the last decade the employment of the "Alpine winter cure" has attained a great magnitude and most encouraging success, especially at the station of Davos Platz, a village in the Canton Grisons, 4,000 feet above the sea level. In this region the temperature from September to May, during the twenty-four hours, seldom varies more than 14° (Fahr.), and the setting in of cold is never suddenly perceived, owing to the remarkably dry and calm air, whilst scarcely a day passes on which the invalid is for any length of time confined to the house, as there is an almost perpetually clear sky.

When the larynx is affected with consumption, whether the lungs are simultaneously involved or not, the prospect, speaking generally, is more serious than when the chest alone is invaded. In the former organ there is great difficulty in staying the malady should it be at all advanced, but in the really incipient stages of laryngeal phthisis, there can be no doubt that appropriate measures will seldom result in disappointment. On this account the early recognition of the disease is of immeasurable importance, for on it undoubtedly hangs the life of the patient.

6. Cancer of the Larynx.

Symptoms.—Cancer is a disease which every one, at least by hearsay, is acquainted with, on account of its excessively fatal character. It may affect almost any part of the body, and is less frequent in the throat than in several other localities. From a practical point of view there is not much distinction between it,

and the malady last described or syphilitic disease when both are in an advanced state. It produces swelling and ulceration, and is accompanied by great pain in swallowing, difficulty of breathing and loss of voice, or at least great hoarseness. It is generally, however, much more rapid and certain in its progress, and having once begun is, as far as we know, incapable of retrogression. It may commence in the larynx and extend to the pharynx, and *vice versa*.

Causes and Prevention.—Whether cancer originates locally or in the constitution is as yet undetermined, as it is also whether it consists in the action of a peculiar protophyte or fungus, like the bacillus, or is a perverted action of the molecules of the body, by which they breed a superabundance of tissue of a normal class, but of an unhealthy type. It is certain, however, that it is most likely to attack parts which are constantly irritated, or which, from previous injury, are in a state of weak vitality and always remain somewhat sore. It is also proved that it can be transmitted hereditarily in families, but cancer in the young and vigorous is rare, and few cases occur till after middle life.

Hence the only preventive measures are to avoid all causes of continuous local irritation, rubbing or scratching parts liable to any slight tenderness, etc., and to be cautious in the permission of inter-marriages where there is bad family history.

Treatment.—As even the most skilled practitioner cannot always be sure to recognize infallibly the first stages of cancer in the larynx, treatment calculated to cure laryngeal phthisis or syphilis is customarily given a fair trial at the outset. When no doubt can remain as to the nature of the malady the treatment must be of a palliative description, directed to the prolongation of life by alleviating pain, and supporting the strength of the sufferer by judiciously systematized diet, etc.

When suffocation is threatened by closure of the windpipe at the larynx an artificial opening can be made lower down, and thus relief to the breathing afforded (tracheotomy).

7. Foreign Bodies in the Windpipe.

Symptoms.—If a foreign substance becomes lodged in the larynx or trachea, the patient usually feels the presence of it, even when its situation or size is not such as to obstruct the breath-way. If the body is of any considerable dimensions it is almost certain to produce sudden and serious, or even instantly fatal, suffocative phenomena. In the adult, of course, the cause of the symptoms will generally be known, at least to the patient himself, but in children proof may often be altogether wanting as to the real origin of the danger.*

Causes and Prevention.—This accident most frequently happens to children, who are almost naturally addicted to putting, and even to holding for a length of time, small articles, toys, etc., in the mouth. Inadvertently, or in course of play, from some jerk or shock, the article is involuntarily swallowed. Sometimes the little patient has gone to sleep retaining purposely or otherwise some small plaything in his mouth, and in an unguarded period it slips downwards by gravity.

In adults the occurrence may be due to a number of trifling causes that need not be enumerated, as in the case of the celebrated Brunel who had a sovereign lodged in his windpipe, which he had pretended to swallow for the amusement of a child. The standard cause of the accident is talking and laughing carelessly whilst eating. A sudden gasp of breath carries a piece of comparatively light food—a fragment of bread, for instance—into the larynx, and if the morsel is large enough, it may at once become jammed, and destroy life in a minute or

* Sudden suffocative symptoms may also be produced by cramp or spasm of the laryngeal muscles, which close the top of the windpipe. In a partial way this affection is rather common in infants. Slight convulsive fits with crowing breathing are the signs of it, and it is called “laryngismus stridulus.”

2. Stricture or Narrowing.

The ordinary examples of this affection arise from injury to the gullet by swallowing some corrosive matter, such as oxalic acid, sulphuric acid, strong hartshorn, etc., either suicidally or accidentally, through mistake for something else. Thus liniments for external use have been taken. If the quantity swallowed has not caused a fatal issue, immediate or after some time, by its effects on the stomach, etc., the inside of the gullet on healing up is likely to become hard and contracted at one or more points. Thus the food cannot make its way down in sufficient quantity to support life, and the patient dies gradually from inanition, or slow starvation practically. Without evident injury, however, cancer sometimes attacks the œsophagus, and by degrees produces a closure of it, with the same results. In the latter case, of course, life can only be prolonged by palliative measures, but when the stricture is of the more simple kind, relief can usually be afforded by passing bougies—round, smooth, and flexible rods, of graduated size—so as to dilate the canal. This treatment is nearly always tedious and prolonged, as the cicatrized parts are prone to recontract continually. A stricture from spasm or cramp of the muscular walls of the gullet also occurs. This is the least serious kind, and, though it may be troublesome, the use of the bougie is generally very beneficial.

3. Dilatation.

Through a certain weakness, local or constitutional, probably both, the gullet occasionally becomes permanently dilated at some part of its course. A diverticulum, or pouch, is sometimes formed, which becomes filled with masticated food during meal-times, and afterwards gives rise to an unpleasant sense of fulness and pressure in the throat. Then frequent eructations

result, which carry morsels back into the mouth. By general tonic treatment and local applications of an astringent and stimulating kind, a good deal of improvement may often be induced, but when a large diverticulum has formed, an absolute cure is scarcely obtainable.

4. Paralysis.

In weak persons, chiefly females, and in those of advanced age, the muscular walls of the gullet may be paralyzed, and thus lose their power of supporting the mass of food firmly whilst propelling it to the stomach. In these cases there is a difficulty in swallowing and a liability to choke, for after the food passes off the mouth, it is left to find its own way past the entrance of the gullet, instead of being seized by the muscles at the bottom of the pharynx and thrust downwards. When, however, it has fairly entered the œsophagus, the loose, palsied walls yield before it, and by force of gravity it drops quickly down to the pit of the stomach, often with a very manifest concussion, disagreeably sensible to the patient. In this malady the constitution must be strengthened by general tonic measures, medicinal and others (change of air, sea-bathing, etc.), whilst the palsied muscles must be invigorated by stimulating local applications, especially galvanism, applied by means of an electrode like, but longer than, that used for laryngeal purposes.* In the aged, though much relief may be afforded, a cure can hardly be looked for.

5. Foreign Bodies.

Through careless eating—"bolting" the food—the presence of these in the gullet is usually to be explained. Thus, pieces of bone, fragments of china or glass, are unperceived on account of the mouthful not being properly masticated, and being hastily

* See p. 30.

swallowed, stick at some point before the stomach is reached. In the same way lumps of meat, crusts, etc., too large to pass down the gullet, are swallowed, trouble not being taken to divide them with the teeth, and become jammed at the narrowest or firmest part of the tube. False teeth may also be swallowed unconsciously during sleep. When the body is soft, the course is to assist it on its downward way by pushing with a probang, a small piece of sponge tied to the end of a rod of whalebone; but in the other cases efforts are made to raise the substance by catching or entangling it with certain instruments devised for the purpose, or, if it is near the top of the gullet, a long curved forceps may be used successfully for extracting it. Should all these means fail, and serious symptoms be present, an incision must be made into the throat, so as to reach the œsophagus, and by making an opening in it remove the foreign body. This operation, called œsophagotomy, is rather difficult, but has several times been performed satisfactorily, with the result of saving life.

V. THE NECK.

In this division we shall describe two important diseases, viz. :—

1. Enlarged Glands.
2. Goitre, or Derbyshire Neck.

1. Enlarged Glands.

Symptoms.—Almost all persons have probably observed, with greater or lesser frequency, the lumps in the neck due to this malady, though every swelling arising in this site is not glandular. The appearances are too obvious to require much description. On one or both sides of the neck, one or more hard, painless, but slightly tender tumours of variable size,

from that of a pea to a small egg, or even larger, arise slowly, but sometimes rapidly, in a great majority of instances affecting children of a few years old. When the glands swell rapidly they are in a state of inflammation, which is very likely to terminate by the formation of an abscess or collection of matter. Sooner or later this causes the surface to ulcerate; a discharge follows and an open sore, which may endure for weeks, months, or even years, without healing up. Such cases, though troublesome, seldom or never terminate fatally, unless complicated with more serious disease of a similar origin in other parts of the body, *e.g.*, hip-joint disease, "white swelling" of the knee-joint, etc.

In adults, however, a malady of a different nature occurs rather rarely, in which the glands of the neck often become enormously swollen, whilst those of most other parts of the body are also considerably enlarged. It is called "Hodgkin's disease," or lymphadenoma, and is generally regarded as necessarily fatal.

Causes and Prevention.—Enlarged glands during early life are the most intimate manifestation of struma or scrofula. We have already treated of this very common constitutional affection when speaking of enlarged tonsils, and indicated its usual origin with such preventive provisions as may be made against its production. To these remarks the reader is referred.*

With respect to Hodgkin's disease, its causes are obscure, quite unknown, in fact, at present, and hence no special hygienic advice can be given for warding it off. Its decided rarity lessens the importance of this hiatus in our knowledge, but no doubt continued observation will in the end fill up the gap.

Treatment.—The remedial measures to be adopted in the presence of scrofula have also been dealt with in the section above-mentioned. Nourishing diet, pure air, change of air, and sea-bathing, with cod-liver oil, are the system on which reliance

* See p. 16.

is to be placed. Drugs are seldom essential, but syrup of the iodide of iron is often used with great advantage.

As regards the local treatment of the enlarged glands, many methods for procuring their reduction are employed with a moderate amount of success. The simplest of all is regular daily friction or manipulation—*massage*, as the French, who are the chief advocates of the plan, term it. The glands are to be rubbed gently with the hand, and also to be squeezed and moved gently with the fingers for a few minutes once or twice daily. This process stimulates, infuses a new vitality into the inert, indolent swellings, and provokes nature to exert herself for their cure. Painting them with tincture of iodine is the commonest of all means resorted to and is generally advisable, but its effects do not promote a very active diminution. More success is obtained by blistering them slightly every week. A device followed very much within recent years is to inject into the substance of the lump a few drops of dilute acetic acid (distilled vinegar) with the needle (hypodermic) syringe. This acid has a softening action on the morbid deposit which causes the tumour, whilst it also stimulates its absorption. This operation is usually repeated once or twice a week.

Beyond general tonic and hygienic treatment no special means of cure have been discovered for Hodgkin's disease.

2. Goitre, or Derbyshire Neck.

Symptoms.—This malady, called also bronchocele, consists in a swelling on one or both sides of the neck, towards the front and low down near the upper part of the chest. The tumour is quite painless, and varies very much in size and consistency. In the most developed instances the swelling may grow to be as large as the patient's head, or even attain such dimensions as to hang down the front of the chest and be capable of being supported by being laid over the shoulder. The swelling is some-

times very firm and hard—most frequently, in fact, when of moderate size—but in many cases it is quite soft, and moves of itself relatively to altered positions of the body, as when the person stands up or lies down. Beyond the inconvenience both with respect to appearance and the trouble of carrying invariably such a burden the patient is unaffected, but in some comparatively rare examples much suffering and danger result from the goitre pressing on the windpipe and causing shortness of breath.

There is also another species of goitre in which the swelling never attains a great size, is always soft, and often has a pulsating or throbbing character, felt by the patient, and even to be perceived by another person on laying the hand, or especially the ear, against it. The most exceptional peculiarity of this form of goitre is that it is accompanied by a prominence of the eyeballs, so that the patient exhibits a more or less remarkable staring expression. This symptom is named *exophthalmia*, and from it the malady receives its distinguishing name, *i.e.*, *exophthalmic goitre*. Palpitations of the heart often accompany it.

Causes and Prevention.—The ordinary goitre has been well known from the earliest ages; Hippocrates observed the malady and thought it arose amongst the inhabitants of the mountainous parts of Asia Minor from their drinking water derived from melted snow. Vitruvius mentions a fountain in Africa the water of which produced goitre in those who used it, and Juvenal* alludes to the "swelled" neck of the Alpine peasant as one of the most familiar objects which met the eye in those regions.

The connection of goitre with the geological formation of a district is well known, owing to the impregnation of the water with some principle which has the power to engender the disease. Every kind of analysis, however, has failed in detecting the really active agent; the notions of its being lime,

* Quis tumidum guttur miratur in Alpihus? etc. Sat. XIII. 162.

sulphate of iron, etc., have prevailed for a time, and afterwards, in default of any real proof, have had to be abandoned in the face of various contradictory facts. Thus we must, in accordance with the spirit of the present day, betake ourselves to the belief that the potent ingredient is a microbe, a bacillus, and try to discover its form with the microscope, staining experiments, etc., until this theory shall be clearly ascertained or, perhaps, like the others, disproved.

Districts in which goitre prevails are well known to the inhabitants, and soon recognized by new comers, owing to the obvious nature of the disease. The localities are indeed very numerous, but of rather variable potency, not one per thousand of the residents suffering in some places, whilst in others a regular percentage are attacked. In this country Derbyshire, in the neighbourhood of the Peak, furnishes the greatest number of examples, whence the popular name, but there are a great many other areas where goitre is met with to a lesser extent. Indeed, it is difficult to find a place in which odd cases may not be found, but, of course, these often have removed from some distant part.

The prevention of goitre lies in the usage only of drinking water proved by the proper periodical examinations to be pure. The disease is not known to have arisen in any city or town supplied with water selected and purified in the regular way by a water company. It seems so far, therefore, to be restricted to country regions where the domestic supply of water is taken directly from a spring, river, etc. Persons attacked should hence change the source of their water supply, or, if this is not possible, leave the district, unless they are oblivious to the chances of the disease progressing rapidly and producing dangerous symptoms.

The enlargement of the neck in goitre is altogether confined to the thyroid gland. When the swelling is hard there is growth of dense fibrous tissue throughout the substance of the

gland, but when it is soft it arises from a cavity being formed which is filled with a watery liquid. This fluid goes on increasing in quantity for an indefinite time, and accordingly dilates the cavity, the walls of which at the same time grow thicker and stronger. The hard goitres are called *fibrous*, those containing fluid, *cystic* (celled). The very large goitres are a combination of both varieties; a number of cavities form, which go on increasing simultaneously, whilst much fibrous substance grows between them in all directions. Hence they are named *fibro-cystic*.

The exophthalmic goitre, though also affecting solely the thyroid gland, is a malady of a totally different nature and origin, but as yet is not completely understood. It arises in females, usually of marked delicacy, and appears to consist in a peculiar weakness of the nerves which allows of a relaxation of the walls of the small blood-vessels in certain sites. The condition is probably allied to, or connected with, hysteria.* No obviously preventive measures can be indicated.

Treatment.—The less pronounced cases, especially those which occur singly in places not clearly goitre-producing, can mostly be cured by tonic treatment and certain drugs, viz., iodine (in the form of iodide of potassium), and the remedy lately discovered by Woakes of London, fluorine (as hydrofluoric acid).

In cases not likely to yield to drugs an operative treatment of a mild nature is now extensively adopted. *a.* For the fibrous goitres injections into the substance of the tumour, according to the method invented in 1867 by Alfred Luton, of Rheims, is usually very successful. A few drops of tincture of iodine are injected once or twice weekly with the needle (hypodermic) syringe. If necessary, the proceeding can be rendered painless by freezing the point of skin at which the needle enters by playing on it for a few moments with the spray of ether. The

* See page 29.

treatment lasts from a few weeks to several months. *b.* For those goitres which consist in great part or altogether of fluid a very rapid means for reducing their size can be practised, namely, to insert a small metal tube (cannula) in their cavity and let the liquid flow out. As, however, the fluid is reproduced rapidly the tube must be kept in for a week or more to keep the cavity empty, whilst, in order to destroy its power of secreting, a small quantity of an appropriate medicament is once or twice injected into the hollow space through the tube. A strong astringent solution is the standard remedy for the purpose. Operating on this kind of goitre, if at all large, usually causes a little feverishness for a few days, but the patient seldom has to be confined to bed.

For the exophthalmic goitres tonics are generally given and required by the patient's condition. Locally, the daily application of electricity is often of great service, but positive cures are very rare.

PART II.

DISEASES OF THE EAR: THEIR CAUSES, PREVENTION, AND PRINCIPLES OF TREATMENT.

THESE maladies have to be considered from a standpoint somewhat different from that whence we usually estimate affections of most other parts, viz., as to their mere effect on the faculty of the organ; in this case the sense of hearing. Thus, on account of the delicate construction and mechanism of the ear, disease, so trifling that in other situations it would scarcely receive any attention, is here often of the greatest moment, both as to its immediate phenomena and its ultimate results. For deafness, present and permanent, may follow a very slight cold, blow, etc., if by chance it reaches an essential

but fragile part of the mechanism of the ear. Hence we can understand the economy of nature, or the process of evolution perhaps, by which the organ proper is protected by being placed in such a secluded position, buried in the depths of a thick and hard bone.

For the purpose of practical consideration of these maladies, we are led—almost compelled—by distinctions of cause and effect, to follow the triple division of the ear naturally indicated.

I. THE EXTERNAL EAR.

Although the visible evidence of ear disease most frequently presents itself by this part, there is but one affection of it that really demands special attention, and that is the **accumulation of cerumen or wax** in the canal or meatus. In addition, we shall allude to **stricture or narrowing** of the canal, the frequent occurrence of **boils** in the same part, and the presence of **foreign bodies**.

1. Accumulation of Wax.—This substance is the lubricating secretion of the external canal with the object of keeping its lining of skin in a soft and flexible state. Owing to its nearly solid consistency, it is capable of blocking up the passage completely, if by any chance it should be present at one time in sufficient quantity. Whether such an occurrence ever takes place when the canal is in a state of virtual health is doubtful, but there is no doubt that some persons have a predisposition to getting their ears stopped by excess of wax, without any further appreciable disease in the part. Under these circumstances, the amount produced is too great to be carried away insensibly by the natural tendency of the wax to approach the outside, so as to be wiped away, etc. In most cases the exaggerated manufacture of this cerumen can plainly be traced to a congestion or waxy catarrh of the canal excited by cold. Deafness then arises in a short time, whilst, of course, when the substance has

collected gradually, the chief symptom of its presence is also of slow growth. It often happens, however, that while a portion of the calibre of the canal is permeable, no inconvenience arises, but on closure of this small channel deafness suddenly is felt. Such closure may often be occasioned by thrusting something—a towel twisted at one end, for instance—into the passage in order to clean it out. Thus the plug of wax is compressed, and caused to fill the whole area of the tube. The cerumen not unfrequently is allowed to remain for years unmoved, sometimes through only one ear being affected, and the deafness being hence disregarded; at others because of being undiscovered, or of a belief having arisen that the deafness depends on some more deep-seated cause. On this account the wax may dry up until it becomes of an almost stony hardness.

The discovery of the fact that deafness arises from the presence of wax depends on examining the canal, directing a strong beam of light into it with the facial reflector.* At the same time the auricle should be pulled backwards and upwards so as to dilate the entrance. Sometimes hairs obscure the view, and then a small tube or *speculum* of a funnel shape can be pushed in for a little way, and the interior down to the drum-head will be seen if no wax lies between.

The *treatment* of this affection consists simply in syringing the wax out of the canal with lukewarm water and a proper ear-syringe, which holds about half a wine-glassful or a little more. If the wax has become hard, it may be necessary to repeat the operation on two or more separate days, and in the meantime an effort may be made to soften it by dropping glycerine into the ear. As a rule, the thrusting-in of all instruments, such as ivory scoops, hair-pins, etc., should be carefully avoided, for much injury to the drum-head has often arisen when by accident, as receiving a push at the time, or inadvertence, the article used has been forced too far inwards. Persons

* See "The Laryngoscope," etc., p. 4.

who have developed a recognized tendency to accumulation of wax may often ward off the occurrence by periodical syringing, once a fortnight or month, with an ordinary small glass syringe and warm water with soap.

2. Stricture or Narrowing.—A complete closure of the external opening of the ear occurs rarely as a deformity at birth, but we have here only to allude to a skin disease, a kind of ekzema or dry tetter, which, when of many years' standing, usually produces a thickening of the canal, and more or less completely closes its orifice. It is generally met with in females past middle age. Owing to the affection often giving little trouble beyond a slight itching, etc., it is likely to be neglected until hearing is actually threatened by the increased bulk of the parts. Any malady of the kind should, therefore, be attended to at the beginning, when it may be checked by appropriate measures. When far gone the only remedy may be the wearing of a small tube or dilator at the entrance of the ear. A protuberant growth of the bone (exostosis) sometimes closes the ear: these are cases very difficult to remedy.

3. Boils.—In persons in delicate health, especially females, a peculiar proclivity sometimes arises to suffer periodically, every few months perhaps, from small painful boils situated just inside the ear, first on one side and then on the other. The treatment consists, of course, in supplying the constitutional defect by carefully regulated diet, change of air, tonic medicines, etc., whilst local relief is afforded by suitable unguents, etc.

4. Foreign Bodies.—Adults do not often suffer in this way, though flies or other insects have sometimes made their way into the external canal, where they may occasion great discomfort and irritation until removed. It will be a consolation to those to whom such an accident has happened to know, from studying something of the construction of the ear, that an earwig or anything similar cannot penetrate to the

brain and produce dangerous effects by this passage, as the drum-head checks its progress before there is any possibility of such a contingency.

Amongst children it not uncommonly happens that they purposely put any small articles with which they may be playing, such as peas, beads, etc., into their ears. Generally, such things fall out again at the time or soon after, during sleep, but often they remain in, becoming fixed by sticking to the wax perhaps, or, when comparatively large and well pushed in, by the child's efforts to get it out with the finger. Bodies like peas will even become jammed in the canal, as they swell considerably in such a position, under the influence of moisture and heat. In cases when the foreign body is small, and does not hence obstruct the hearing, it may hold its place for long without its presence being known. Ultimately it may work its own way out without having done any harm.

The removal of foreign bodies is almost invariably best effected by the use of the ear-syringe precisely as in treating stoppage by wax. Numberless other devices have been and often still are employed, *e.g.*, slender forceps, small crooks, sharp and blunt probes of wood or metal with some sticky matter on one end like glue, etc. etc.; but such instruments are much less successful and of much more limited suitability than the syringe. In fact their use is a delicate feat of manipulation, which demands that the patient must keep perfectly steady, a condition which is least of all to be complied with in children, who are the usual patients.

II. THE MIDDLE EAR OR TYMPANUM (DRUM).

Practically, the diseases of this part of the ear are much the most important to be considered, for two reasons: first, that they nearly always produce deafness, decided or complete;

and secondly, because they are most likely to be cured. The divisions of the subject are few, however, and we shall only make three, viz. :—

1. Acute Inflammation.
2. Chronic Inflammation.
3. Polyps or Growths.

1. Acute Inflammation.

Symptoms.—These vary with the extent or kind of the malady.

a. We may have a catarrh or acute cold in the ear, the effect of which is to bathe the cavity of the drum in moisture and also the Eustachian tube, whilst the membrane lining those parts is swelled and congested. As a result there is a feeling of great fulness in the ear, with very decided deafness, and frequently a dull roaring sound like that of a sea-shell, occasionally permeated, so to speak, by a faint singing, resembling, perhaps, a shrill but very distant railway whistle. On blowing the nose all these symptoms are increased by the wind rushing up the Eustachian tube and disturbing the tender parts by extra pressure, etc., and under these circumstances a little pain may even be felt. In a minute or two, however, this exaggeration of the morbid sensations wears off again. In slight cases the only evidence of the catarrh occurs in connection with blowing the nose.

b. In the other form of acute inflammation the malady is less extensive, but more intense in its limited area. Few of the symptoms last described are decidedly present, but a more trying one, namely, considerable otalgia, or pain in the ear, is almost invariably the prime characteristic of the malady. Throbbing in the ear occurs, and, as a rule, the inflammation proceeds to the formation of a small abscess in the cavity of the drum. Spon-

taneous relief is usually afforded by its bursting through the drum-head, when a discharge of pus or matter runs from the ear externally. So far, however, the hearing is, in most cases, but slightly affected.

Causes and Prevention.—*a.* The catarrhal form occurs from cold, and usually, in fact, in direct relationship to a cold in the head. The cold extends from the back of the nose up the Eustachian tube for a variable distance. When the entrance of this canal is swelled, so that it no longer opens freely in swallowing, most of the signs are produced by confinement of the air in the drum. When the lining of the drum itself is affected, the motions of the ossicles and drum-head are impeded and stopped, the result of which, as far as sensation is concerned, is proportionate increase of the deafness. Less frequently it is connected with a cold in the throat (pharynx), and occasionally it arises separately from getting water in the ears whilst bathing or washing. This account of its causation sufficiently indicates the preventive precautions required, which are chiefly those mentioned when treating of colds in the nose and throat.*

b. The more intense form of inflammation, mostly terminating in abscess, arises in persons out of health from any cause, *e.g.*, insufficient food, overwork, mental depression, etc., and though different in situation, occurs for the same reasons as the small periodical boils seen in the external canal.† Sometimes, however, it originates in cold taken when the patient has been exposed, in one side of the back, to a severe draught, an east wind most frequently, as when sitting outside some vehicle, at the open window of a railway carriage, etc.

These remarks apply chiefly to adults, but it is in children that the malady is usually seen, and it probably furnishes more cases of permanent deafness than all other ear diseases taken together. The exciting cause of it in early life is the period of delicate health which follows those affections from which hardly

* See pp. 7, 18.

† See p. 51.

any child escapes, viz., whooping-cough, measles, and scarlet fever, but especially the last. Small-pox is also a very potent cause, but less frequent on account of its comparatively rare occurrence.

For prevention, then, adults should pay attention to the general laws of hygiene, and should beware of prolonged ill-health from the causes named; the constitutional vice will rarely fail to show itself in some local disorder. Persons should also be fully awake to the dangers of sitting in draughts. In the case of children convalescent from the fevers named, they should for the first two or three weeks be kept carefully in a room, spacious, warm, and free from draughts, whilst they should have a diet of the most nourishing but not too heavy class, with perhaps a little wine or stout twice a day. The child should not be allowed to go out until the strength is fully restored, or until the weather is favourable. Tonic medicines are also advisable.

Treatment.—*a.* For the acute catarrh the domestic remedies for a cold—hot drinks, putting the feet in mustard and warm water at bed-time, etc.,—are legitimate resources; but our chief reliance must be placed in the proper use of warm-water inhalation, in which some appropriate soothing or stimulating medicament is mingled. For the treatment of ear diseases the patient must inhale as follows:—Having filled the chest by inspiring the steam through the mouth, shut the latter and close the nose by compressing the nostrils with the fingers. Then force the air from the chest into the head, but with gentleness, and when an impulse of expansion is felt in the ears, discharge all the surplus breath through the nose. This proceeding may be repeated from eight to a dozen times whilst the patient is inhaling; in the intervals ordinary inhaling should be carried on, inspiring by the mouth and expiring by the nose. By this means we cause the steam to pass into the cavity of the drum by the Eustachian tube at one time, whilst with the ordinary

expirations through the nose we maintain the effect by allowing the medicated vapour to act on the top of the pharynx, where is most frequently the starting-point of the catarrh.

b. Abscess of the tympanum cannot be treated by inhalation, because the efforts of inflation generally increase the already distressing pain. Besides, the area affected is so limited that it could scarcely be beneficial. In these cases we must try the effect of constant heat to the part by some kind of warm application—poultices, in fact. The best method is to have small bags filled with bran kept in hot water, and from time to time wrung out and laid on the affected ear, continually changing the bag, which has cooled by being on for some minutes, for a hot one. In addition, drops of some soothing or pain-relieving drug may be dropped into the ear a few times daily, Tonics and the general dietary means, etc., for restoring impaired health will also have to be employed assiduously for some weeks or months.

2. Chronic Inflammation.

Symptoms.—Here also we find two classes of cases corresponding to the two varieties of the acute form we have just described.

a. The first are catarrhal cases, and in three instances out of four probably are simply examples of the acute catarrh, which, from neglect or some other cause, have not got well, but have gradually become established as chronic conditions. In these examples almost the only symptom is deafness, very variable in degree during the first few months or even years, but nearly always progressing from its point of departure until practically complete. The malady occurs, however, as a slow extension of chronic catarrh of the nose or pharynx, and consequently has never passed through a period of acute exacerbation.

In early life this affection is also very common as a part

of the scrofulous results more readily recognized in enlarged tonsils. The whole upper part of the pharynx and the posterior nares often participate in the morbid thickening, from which the Eustachian tube is rarely exempt. This canal being partially stopped, considerable deafness arises, which, however, is seldom so pronounced as in the old-standing catarrh of adults, and frequently even undergoes amelioration spontaneously as age advances and the general health becomes consolidated.

b. Chronic abscess (otorrhœa) of the drum is almost invariably the sequence of the acute form, and the discharge of matter from the ear continues more or less profusely for an indefinite period, sometimes during the greater part of life with occasional intermissions. Its persistency is more usual in children than in adults. In this condition the drum-head is always perforated, and often eaten away in the greater part of its extent by ulceration.* Thus the chain of ossicles, or sound conductor in the drum, being totally deprived of their support on one side, are very likely to become quite detached and to be washed out of the tympanum altogether with the discharge. Nevertheless, in chronic abscess the deafness is, on an average, decidedly less than in cases of ordinary chronic catarrh, where the drum-head is structurally intact. Indeed, when the tympanum is rendered inactive as to its mechanism by disease, the entire clearing out of its cavity is often practically beneficial, as far as hearing is concerned, for a free passage is then opened up for the sound-waves of the air to beat directly against the membranes closing the oval and round apertures of the internal ear, which lead to terminal expansion of the auditory nerve.

Causes and Prevention.—As these affections spring directly from maladies that have been already described, these questions

* Perforation of the drum-head is easily recognized by the hissing or squeaking noise that occurs on inflation by the patient himself, or by the Politzer inflator (see p. 58). The air, of course, passes out through the abnormal opening, after being propelled along the Eustachian tube.

have necessarily been dealt with in several previous sections. The prevention of the different species of chronic inflammation of the drum lies in guarding against the occurrence of the diseases to whose pre-existence they owe their origin, and when those maladies are already developed, in the proper treatment of them, by which their extension and persistency are rendered unlikely or impossible. To avoid repetition, therefore, we must refer to what has been said under this heading in the last section, and in the articles on chronic catarrh of the nose* and pharynx,† and on enlarged tonsils.‡

Treatment.—*a.* In the catarrhal form any disease of the throat or nose must be treated by appropriate measures specially modified so as to influence simultaneously the affection of the tympanum. Thus the method of inhalation lately described§ will tend to cure the morbid condition of those parts as well as of the ear. The same remark applies to application of astringent solutions, etc., to the upper part of the pharynx and posterior nares, with a curved brush,|| for the medicament will at the same time reach the opening of the Eustachian tube and perhaps penetrate it for some distance by capillary attraction (soakage). Systematic inflation of the drum by Politzer's method daily or less often is also usually very advantageous. This operation is performed as follows:—The patient takes a little water in the mouth, which he keeps shut, and then the operator, with an india-rubber bottle-syringe, the outlet of which is adapted to fit or cover the nostrils, sends a blast of air through the nose, at the same instant desiring the patient to swallow the water. The result is that the Eustachian tube, being opened by the act of swallowing, the air rushes up into the tympanum, an occurrence which the patient generally becomes aware of by feeling a decided impulse at the drum-head externally. By means of this procedure the tendency of the Eustachian tube to

* See p. 9.

† See p. 14.

‡ See p. 16.

§ See p. 55.

|| See p. 27.

remain abnormally closed is counteracted, and a stimulating effect is also communicated to the structures of the drum, which may consequently make active vital efforts to regain a healthy state. Consolidation of the drum-head and of the joints of the chain of ossicles is also remedied by the artificial motions they are compelled to make by the rush of air. Catarrhal discharges, mucus, etc., collected in the cavity may, moreover, be scattered about, and prevented from becoming inspissated into an almost solid mass, which impedes the movements and renders impossible the vibrations of the ossicles, when they are required to conduct the sound-waves from the drum-head to the fluid of the internal ear.

Another method of procuring the effects just described is by injecting regularly a small quantity of astringent solution into the cavity of the tympanum. This operation can be performed by passing a small tube (of silver or other material) curved at one end,* along the floor of the nose till it reaches the pharynx, when by turning the curved end towards the outside it can easily be made to enter the orifice of the Eustachian tube.† The fluid is contained in a small india-rubber ball, by means of which it can be propelled along the artificial tube so as to enter the Eustachian canal. To make assurance doubly sure a second and longer tube of a soft, flexible kind can be previously passed inside the rigid one, so that the end of it may find its way actually or almost into the tympanum. This method of treatment, however, has been greatly neglected of late years, because, in the first place, it appears nearly certain from experience that all the good it may do can be effected much more safely and expeditiously by Politzer's plan of inflation; and secondly, because the solution used must be weak, whilst the precise point to which it penetrates can seldom be determined with any exactitude.

* Called an Eustachian catheter.

† See Fig. 1 (Frontispiece).

A third method of treatment has at some recent periods been tried in cases where the hearing is very deficient, and it seems certain that the cavity of the drum is blocked up by old discharges. This plan is to make an opening into the tympanum by perforating the drum-head, or excising a small piece of it with a slender knife, which can be passed in from the outside. The operation* is scarcely painful, and by means of it the collected mucus, etc., may come away, whilst sound may also enter and affect the internal ear directly. By the aid of Politzer's inflater the foreign matter may even be blown out of the drum into the external canal. In practical application, however, the proceeding has not been very successful, and only a small percentage of persons on whom it has been tried have derived any marked benefit from it. The chief reason of its usual failure is the difficulty of keeping open the aperture made in the drum-head; it mostly heals up again in a week, and then, as a rule, hearing relapses to its former state. To obviate this occurrence some aurists have endeavoured to maintain a small tube or eyelet in the artificial opening, but the firm and lasting adjustment of such an ear-pipe is a matter of great difficulty.

With respect to curability of this form of ear disease, it may be said that during the first twelve months of their duration cases readily yield to systematic treatment; but after they have been in existence for a term of years, going, as most frequently happens, from bad to worse, cure is generally out of the question, and amelioration, even under the most judicious measures, not always certain. Under these circumstances persons with long-standing deafness in one ear only can hardly be recommended to undergo treatment as long as hearing is moderately clear on one side.

When both ears are incurably deaf, ear-trumpets and conversation-tubes may be resorted to. The ordinary funnel-shaped

* Called paracentesis tympanum, or "tapping the drum."

trumpets are the most effective, and their strength depends on their size. Unfortunately the small "ear-cornets," etc., are of little or no value except in very slight cases. A plain tube, about a foot long and an inch and a half in diameter, made of stiff, hard pasteboard is often more powerful than the most expensively constructed metal trumpets.

b. When a discharge of matter from the ear appears to have established itself permanently, the first consideration as regards local treatment is to prevent the accumulation of the noxious liquid in the cavities and channels of the ear. With this view the ear should be carefully cleared out by means of warm water and a small glass syringe weekly, daily, or twice a day, according to the profuseness of the discharge. Were this simple measure regularly practised in every case from the beginning of the malady, especially in children, there can be no doubt that the aurist would rarely be called on to treat discharges of several years' duration. At the same time it will generally be advisable to use the Politzer inflator periodically as an adjunct to the syringing, as by blowing through the Eustachian tube the matter may be ousted out of many chinks and recesses in which it would not otherwise be disturbed. Astringent solutions to be dropped into the ear are often also of great value. Constitutional means in conjunction, particularly cod-liver oil,* tonics, sea-bathing, etc., are rarely to be dispensed with. Treated promptly on this plan, the disease will seldom make any material ravage in the tympanum, and hearing will not be very manifestly lessened.†

An *artificial tympanum*, in cases where the drum-head has been in great part or wholly destroyed by ulceration, can often be used with great advantage. This device is merely a thin

* See p. 34.

† Neglected ear discharges are sometimes the cause of extensive disease of the adjacent bones, and the morbid process may even spread through the internal ear to the brain with fatal results.

disc of some light and slightly flexible substance,* to which a slender wire, about two inches long, is centrally attached. It has to be cut round with scissors so as to fit pretty accurately the ear of the person for whom it is designed. It is pressed down the external canal with a probe till it reaches the bottom, care being taken, of course, that it does not turn sideways. When necessary it can be withdrawn by the wire and cleansed, or a new one substituted for it. The manipulations of the artificial tympanum become part of the patient's own duties. In some instances the relief to deafness from its use is very considerable. There is, however, another kind of artificial tympanum of a much simpler material, namely, a little mass of cotton wool. It is pushed down gently till it presses against the drum-head, or whatever remains of it, and when in a certain position generally increases the hearing power markedly, probably by giving support to the ossicles. The patient must learn to manage the cotton-wool for himself, at least after the first time, and a fresh piece must be introduced more or less frequently according to the amount of discharge. It may be remarked that unless the latter has ceased, or the ear can be kept moderately free from it, the use of either kind of artificial tympanum will not be very effective.

3. Polyps or Growths.

Symptoms.—The filling up of the external canal by a pink, fleshy growth is a rather common occurrence in the annals of ear diseases. It mostly springs from the posterior wall of the tympanum, perforates and gradually causes the destruction of the greater part of the drum-head, advancing outwards till in the course of months, perhaps years, it may form a round projection, of the size of a large pea, at the entrance of the ear. Invariably accompanying it there is a moderate or even copious flow of matter, which is continually oozing out of the ear around

* Thin caoutchouc or gutta-percha answers best.

it. There is no pain associated with it, and in most cases the patient does not know of its existence until it becomes very obvious externally ; seldom, indeed, till he is informed of its presence by another person. Sometimes the polyp is very friable in substance, so that little fragments of it are often discharged ; at others it is very tough, particularly when it protrudes from the orifice of the canal.

Causes and Prevention.—Previous disease of the tympanum is almost a necessity for the engendering of these growths, and, as a rule, their origin and nature depend on the presence of a continuous discharge of matter. They are the offspring, therefore, of the affections dealt with in the last section, and on the prevention or speedy cure of these latter rests the warding off of polyps. The reader is hence referred back to what has already been said under this heading.

Treatment.—The growth must be removed at the earliest opportunity, and afterwards the root must be treated with occasional caustic applications to prevent its sprouting afresh. The discharge of matter often ceases as soon as the polyp has been extracted, and the base healed up ; otherwise it requires the same attention as the ordinary otorrhœa. Of course, when the mass blocks up the passage hearing is nearly abolished, but on its removal it rarely happens that the faculty is quite restored, on account of the usually serious concomitant disorganization of the drum.

The extraction of these growths is effected by the aid of a small instrument devised by Wilde, of Dublin, which is fitted with a silver wire arranged so as to project in a loop from one end. This loop is passed over the polypus, and then tightened on it as far back as possible ; then by a firm and rapid pull the growth is torn out by its root. When it is tough a sharp but momentary pang is felt, and a flow of blood follows for a few minutes. The friable polyps are almost devoid of sensation, and scarcely bleed on being severed.

III. THE INTERNAL EAR, OR LABYRINTH.

Two rather distinct affections may be noticed here :—

1. Nervine Deafness.
2. Menière's Disease (Giddiness, etc.)

1. Nervine Deafness.

Symptoms.—This condition may be defined as deafness, variable in degree, occurring in adults with no other evidence of disease of the ear. It may commence slowly and gradually, become worse in the course of a few months, until hearing is almost totally abolished ; or it may attack the patient suddenly, whilst walking the street, perhaps, or in the course of some night during sleep, being only perceived on rising in the morning. It may affect one ear or both, most frequently the latter, but the hearing power of the two ears is usually different. The malady occasionally disappears as rapidly as it came, but the respite is hardly ever of long duration, a relapse soon occurs from which there is no recovery.

In nervine deafness most frequently is seen in full development the symptom, which is seldom altogether absent in cases of ear disease, viz., *tinnitus aurium*, or ringing in the ears, noises in the head, etc. Very deep and loud roaring sounds, like distant thunder, railway trains, etc., are often complained of by the patient. They are most severe about the early stages of the malady, but amelioration usually takes place spontaneously in the course of time.*

* The tinnitus may be very great without any nervine disease. Slight and simple causes will often produce it, such as wax touching the drum, and, no doubt, thickened discharges in the cavity of the drum pressing on the membrane of the oval or round apertures. The ill-understood phenomenon of "hearing better in a noise," appears to occur most frequently in nervine deafness. The nerve seems to be excited by the extraordinary vibration of the drum-head and ossicles to a temporary susceptibility.

Although the history of the case frequently indicates very clearly the presence of this kind of deafness, in many instances there is little or no obvious evidence to distinguish it from catarrhal disease of the drum, with which it may even be complicated. Fortunately, however, there is one test which annihilates all doubt, and that arises in connection with the faculty of conduction of sound through the substance of the body, often popularly exemplified. Thus, when no sound can reach the nerve of hearing on account of the destruction of the auditory office of the drum, the vibrations will still be perfectly audible if communicated to the bones of the head—that is, if the auditory nerve still exists in a healthy state. Hence, if we strike a tuning-fork and press the end of it firmly against the head of a deaf person, he may hear it loudly or not hear it at all. In the latter case the form of deafness may infallibly be pronounced to be that which we are dealing with.*

Causes and Prevention.—Here our knowledge is not in a very advanced stage. We can only assert proximately that nerve deafness comes on in marked association with some great strain on the nervous system. Thus, after severe fevers in which the head has been affected (delirium, stupor, etc.); after sunstroke, slight or otherwise, or shock to the ear by violent explosions; in females after the trials of confinement; and in nervous exhaustion by hard study, we frequently have examples of its production.† In many instances, however, there is no special reason for its advent to be recognized; it occurs like a paralytic stroke, the effect of which is restricted to the nerve of hearing, probably from inflammation limited to the cochlea, and not otherwise interfering with the vital economy. From what is known of the

* It must be noted that a healthy person will not hear the sound of the tuning-fork unless he stops his ears. Otherwise the slight hum is dispersed, overpowered by general buzz, etc.

† The deafness of old age generally results from a gradual loss of power in the nerve, but there may also be thickening of the drum-head and stiffening of the ossicles.

use of this part, it is at least certain that the malady must potently act on the cochlea or the branch of the nerve leading to it, whether it may extend farther or not. The existence of the tinnitus points out that active irritation of the nerve exists, and its cessation either that the irritation has stopped or that the nerve is practically dead.

Its prevention, therefore, does not suggest any very direct precautions that should be taken, beyond compliance with the general laws of hygiene, and avoidance of mental strain, worry, debilitating excesses, exposure in tropical climates, etc.

Treatment.—When the malady appears to be threatened the patient's course of life should be changed, should there be any decided evidence of its making too great demands on the nervous energies. At the same time tonics, especially such as may strengthen the nerves—*nux vomica*, for example—should be given. Change of air, sea-bathing, mental recreation, etc., must also be appealed to. Locally, the use of galvanism offers the best prospect of success. The current may be sent from one ear to the other by suitable electrodes inserted in each canal; it may also be directed through the Eustachian tube by passing the laryngeal electrode* up behind the soft palate to the orifice of that canal. A favourable influence may also be exerted by inhalations and inflations,† carried out regularly by the patient himself.

Unless in the very early stages, the prospects of cure in nervine deafness are very small; it is the most intractable of ear diseases, and when the power of the nerve has failed for any length of time, its susceptibility can by no means be resuscitated.

2. *Menière's Disease* (*Giddiness, etc.*).

Symptoms.—This title has been given to attacks of vertigo, often accompanied by noises in the ears and deafness, more or

* See p. 30.

† See p. 58.

less pronounced. Persons suffering from the malady exhibit none of the serious symptoms which suggest brain disease, such as paralysis, loss of memory, imbecility, etc., nor any apparent weakness of the heart, inducing tendency to faint on slight provocation. But they are liable to be attacked by swimming in the head, aggravated giddiness, etc., in the most unexpected manner, so that they may fall down in the street or in crossing a room, unless something is close at hand to be laid hold of for support. In the milder cases there may be no marked deafness, and the symptoms sometimes disappear after a short duration without the patient being apparently any the worse.

Causes and Prevention.—Here obscurity predominates, but what has been said in the last section under this heading is almost equally applicable to this malady. The disease is in the nerve or one of its branches. It appears likely, however, that in these cases the chief site of the morbid action is the semicircular canals,* as is the cochlea in the uncomplicated nervine deafness.

Treatment.—The indications for treatment also carry us back to what has been said above. The use of galvanism, however, is ordinarily dispensed with when the special symptoms are active.

Deaf-Mutism.

Symptoms.—Here we have to treat of persons who are born deaf, or who become so within a few years after birth. In the case of infants, parents soon suspect the absence of hearing power from the vacancy and obtuseness exhibited by the little ones when spoken to, in the presence of any loud noise, etc. They are often, however, misled by finding that the infants, after a few months, utter certain articulate sounds, owing to a natural and inherent impulse to exercise the vocal organs, which

* See p. 68.

are usually quite normal, as they move about their legs and arms persistently from the hour of their birth. Thus almost every infant before it reaches the age of six or eight months will utter the syllables *ma* and *da*, frequently repeating them for several minutes at a time. Deaf children also, before a year old, will be affected by any general vibration, such as the slamming of a door, which shakes the room, and thus be supposed to hear. But at ten or twelve months old the fact as to whether a child can hear or not is easily determined by making any loud clear noise suddenly behind its back—a whistle, for instance; for if it does not start, turn, or exhibit some consciousness of the sound it must be concluded to be deaf.

When children of eighteen months or older, who have already begun to speak and answer, become deaf, there is, of course, no room left for doubt. Comparison with the previous period, the marked change in the demeanour of the child, and particularly the fact that it ceases to learn more words, whilst forgetting those it had been in the habit of using, quickly betray its deafness beyond all question.

Causes and Prevention.—Amongst those born deaf there are two classes, viz., those who appear to inherit deafness as a family peculiarity, like a certain cast of features, etc., and those who are original examples of the condition, not being known to have relations similarly affected. In both classes some malformation of the ear exists, such as absence of the cochlea, of one or all of the semicircular canals, of the oval and round apertures leading to the labyrinth, etc. We will now say a few words about each class separately.

a. Those who inherit deafness are found, by statistical researches, to form more than half the number of those who are congenitally deaf ($54\frac{1}{2}$ per cent. according to one calculation). Deafness is inherited, of course, through the intermarriage of actual deaf-mutes, or of members of families who contain such. The causes of the frequency of such marriages are very obvious,

and may be enumerated as follows:—(1) hearing people have more or less of an objection to deaf-mutes; (2) deaf-mutes are usually educated and maintained apart in special schools, institutions, etc., and thus seldom meet persons except of their own kind; (3) understanding usually only gesture language, they can have little or no friendly intercourse with hearing people; (4) for these reasons also families containing deaf-mutes are likely to become known to each other through the tendency of such members to be acquainted and to associate.

The means for *prevention* of the methodical increase of this class for deaf-mutes are hence very plain: (1) Let them be distributed through, and brought up as far as possible with the children of ordinary schools; and (2) let them be taught to understand hearing people by lip-reading, and to converse with them in oral language. By the universal application of these remedies, then, the tendency to the hereditary production of deaf-mutes would be reduced to a minimum.*

b. Those who are born deaf in families previously not distinguished for the production of such offspring, derive their malformation from some constitutional vice or defect of their parents. Scrofula is the most active agent in engendering such cases. But there is another potent cause in parents who may be individually healthy, but who in conjunction are practically of defective constitution, viz., consanguinity. Thus, statistics again show that in deaf-mutes of this class, 1 in 10 is the offspring of marriage between cousins. Here also, therefore, the causes being to a great extent known, there is a clear indication for the prevention of deaf-mutism.

We have now to speak of persons who form a third species of deaf-mutes, those, namely, who have become deaf by disease within the first few years of life. This variety constitutes

* In connection with these remarks see the "Athenæum," January 3, 1885, for an account of Professor Graham Bell's "Memoir on the Formation of a Deaf Variety of the Human Race."

about forty per cent. of the whole number of deaf-mutes. The causes of deafness in childhood are scarlet fever, measles, small-pox, and brain disease. We have already described such cases in the section on acute inflammation of the tympanum, with the measures which should be adopted in order to check the disease. The prevention of increase of deaf-mutes of this category lies in compliance with the rules previously given.* In a few of the cases, however, the nervous part of the ear has been destroyed, and the deafness has been irremediable from the beginning.

The proportion of deaf-mutes of every kind to the general population is, according to various statistics, from 1 in 2,000 to 1 in 1,500.

Treatment.—The treatment of the incurably deaf, who have become so before they could learn to speak, is to educate them so that their infirmity may be as far as possible neutralized. The extensive system for the training of deaf-mutes now practised is entirely of modern growth. The ancients regarded the deaf-mute as almost on the same level with the idiot. Thus, Lucretius lets us infer that the standard opinion as to such persons was that no kind of sense could be taught them.† Thus they were left to gain what apprehension of social aims and requirements could be picked up by their own unaided efforts.

Both the system of gesture language, or talking with the fingers, and the oral language with lip-reading appear to have come into use mainly by natural growth. The efforts of deaf-mutes to make themselves understood commonly includes both gestures and attempts to imitate the motions of the vocal organs as seen in others. As early as 685 A.D. the Venerable Bede mentions a man born deaf who could hold audible conversation. Nevertheless, the regular development of either system and the

* See p. 58, etc.

† "Nec ratione docere ulla suadereque surdis, quid sit opus facto facil est," etc.—L. v., 1,051.

establishment of training schools for the deaf are scarcely older than the present century. To enter into the details of the course of instruction adopted in either of the methods of training does not come within the scope of this treatise. We have pointed out above that there is a pressing necessity for the extension, if possible, for the universal practice of the oral system, by which the pupil obtains a fair chance of being in after life able to hold converse and associate with mankind generally. Here the obstacle which stands in the way is evidently the comparative facility with which the sign language can be taught. The oral plan demands much more time and pains, with greater tact and perseverance on the part of the teacher. Hence unfavourable reports of its success have often been issued, and the failures have been set down to the incapacity of the pupils. These biased opinions must not, however, be allowed to discourage either parents, pupils, or trainers. There is the evidence of competent authority that as many as ninety-nine per cent. of deaf-mutes can be taught to speak to a practically useful extent.* With the wide exemplification of this fact, the isolating gesture language may at some near future time be regarded as a thing of the past.

* The chief school in London for the oral system is at 15, Fitzroy Square, W.

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